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TROPICAL DISEASES BULLETIN

Vol. 9. 1917 No 1

ISSUED UNDER
THE DIRECTION OF THE
HONORARY MANAGING COMMITTEE
OF THE
TROPICAL DISEASES
BUREAU.

General Editor:
THE DIRECTOR OF THE BUREAU.

London:
TROPICAL DISEASES BUREAU,
Imperial Institute, S.W.

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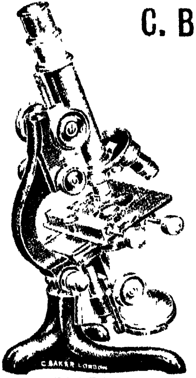

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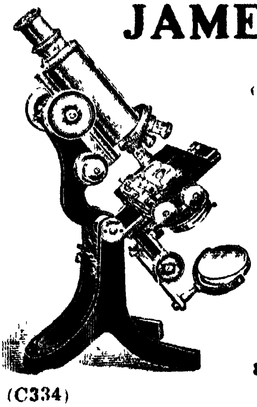

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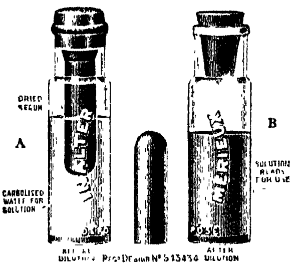

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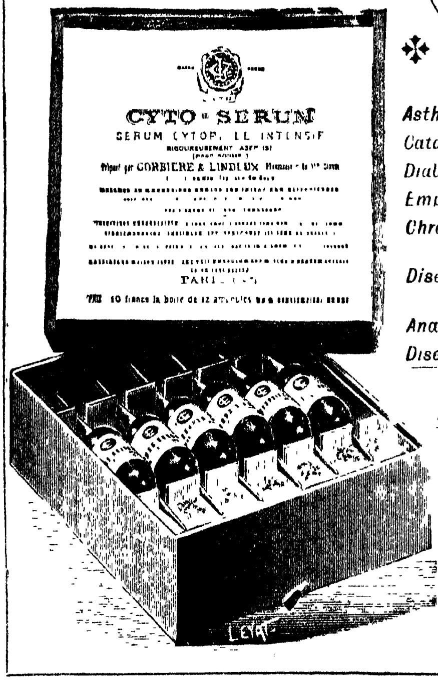
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TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 9.] 1917. [No. 1.

ENTERIC FEVERS IN THE TROPICS.

ARCHIBALD (R. G.), HADFIELD (G.), LOGAN (W.) & CAMPBELL (W.)—**Reports on the M. and H. Laboratories dealing with the Diseases affecting the Troops in the Dardanelles.**—*Jl. Roy. Army Med. Corps.* 1916. June. Vol. 26. No. 6. pp. 695–724. With 10 charts. [Typhoid and Paratyphoid Fevers. pp. 700–709 & 713–714.]

Only part of this long and interesting "Report" is dealt with in this section of the *Bulletin*.* The authors are all of them officers in the "R.A.M.C." and their work is valuable not only for intrinsic merit, but because, as will be duly noticed, it confirms work done by other observers.

"Bacilli of the typhoid paratyphoid group were obtained by blood culture from 147 cases; of these 21 were *B. typhosus*, 41 *B. paratyphosus* B, 70 *B. paratyphosus* A; in addition there were 15 inagglutinable strains of the paratyphoid group, of which 1 resembled *B. paratyphosus* A in type, others *B. paratyphosus* B."

It is pointed out that it is only during the early days that positive results can be expected, the authors giving, in proof of this statement as to the duration of the bacillaemia, the following figures:—

"All cases, including typhoid and infections by inagglutinable paratyphoid like bacilli	6·35 days.
B. paratyphosus B infections	5·37 ,,
B. paratyphosus A ,,	5·99 ,,
B. typhosus ,,	8·30 ,,
B. paratyphosus (inagglutinable infections)	9·1 ,,

"There appeared, therefore, to be a longer bacillaemia in the *B. paratyphosus* A infections than in the *B. paratyphosus* B, with the *B. typhosus* infections longer than either. . . ."

"These facts go to emphasize the necessity of making blood cultures in the *first* week from all patients showing a sudden or moderately sudden illness with rise of temperature, headache, shivering, generalized pains, and a furred tongue. . . ."

"Many opportunities of doing blood culture were lost owing to prevailing sand-storms that rendered an aseptic operation in the tents impossible.

"A two per cent. solution of sodium taurocholate in distilled water was the medium used for blood culture."

---

* The greater part is summarised in Vol 8, pp. 378–80

(C334) Wt.P3137/63. 1,850. 1.17, B.&F.Ltd. G.11/4. A

As a rule 5 to 7 cc. of blood were mixed with 10 cc. of the medium at the bedside, and it is important that the mixture should be well shaken before it is put into the incubator. From this medium McConkey's plates were spread daily for four days till growth was evident. Subcultures were made from isolated colonies and these were tested with glucose, lactose, etc. and against specific sera.

> "The less satisfactory methods of agglutination tests with the patient's serum and examination of the stools were resorted to where request for blood culture in the early stages had not been made or where blood culture had proved negative; in some instances, too, the patients had passed the stage of bacillaemia by the time they reached the hospital. . . "
>
> "For faeces McConkey's plates were used as a routine, with Endo and Conradi-Drigalski as an occasional variation."

The clinical features of the various infections and the cultural behaviour of the respective bacilli conformed to what is generally known except as regards "a noticeable characteristic of *B. paratyphosus* A." This bacillus while agglutinating with a specific serum after it had lost its power of progressive motion retained a "twirling, rotatory movement"; "a whole clump of agglutinated bacilli, eight to twelve in number, spinning round." The reviewer does not think that this phenomenon has been previously recorded.

The chart (Fig. 1) shows the relative proportions of the three types of enterica prevalent at M during the months August to January.

> "No inagglutinable strains and no cases diagnosed by agglutination tests with the patients' serum are included. The figures represent the number of *B. typhosus*, *B. paratyphosus* B, and *B. paratyphosus* A obtained from patients during each month in the Laboratory, calculated as a percentage of the total number isolated each month of the three combined."
>
> "In August typhoid led the field. . . In September and October the paratyphoid B steadily rose, while the typhoid and paratyphoid A fell to a negligible amount. . . . About the middle of November, with almost startling suddenness, the paratyphoid A shot up, while paratyphoid B fell. The typhoid, as before, remained low"

If these statements extracted from the Report, and the chart, are compared with statements and charts in another report on an epidemic of "camp jaundice" connected with *B. paratyphosus* B (SARRAILHÉ and CLUNET, this *Bulletin*, Vol. 8, p. 73 et seq.) resemblances will be found. Atypical paratyphoid bacilli were found in both sets of cases. These bacilli came from the same topographical area and from the same class of patients.

On page 714 of the Report it is recorded:—

> "Catarrhal jaundice formed the greater portion of the so-called 'epidemic jaundice.' . . ."
>
> "Blood cultures were made from sixty-four cases of jaundice; most of these were cases of catarrhal jaundice with slow pulse and normal or subnormal temperature; all of these gave negative results. Cases of jaundice with pyrexia were less frequent, but nine of them gave a positive result, *B. paratyphosus* B being found in five cases, an inagglutinable strain of *B. paratyphosus* in two cases, and Gram-negative, motile, non-lactose fermenters (which could not be worked out owing to the evacuation) in two cases. . . ."
>
> 'In these cases of positive blood culture one gained the impression that the jaundice and the paratyphoid fever were concomitant infections."

Fig. 1.*

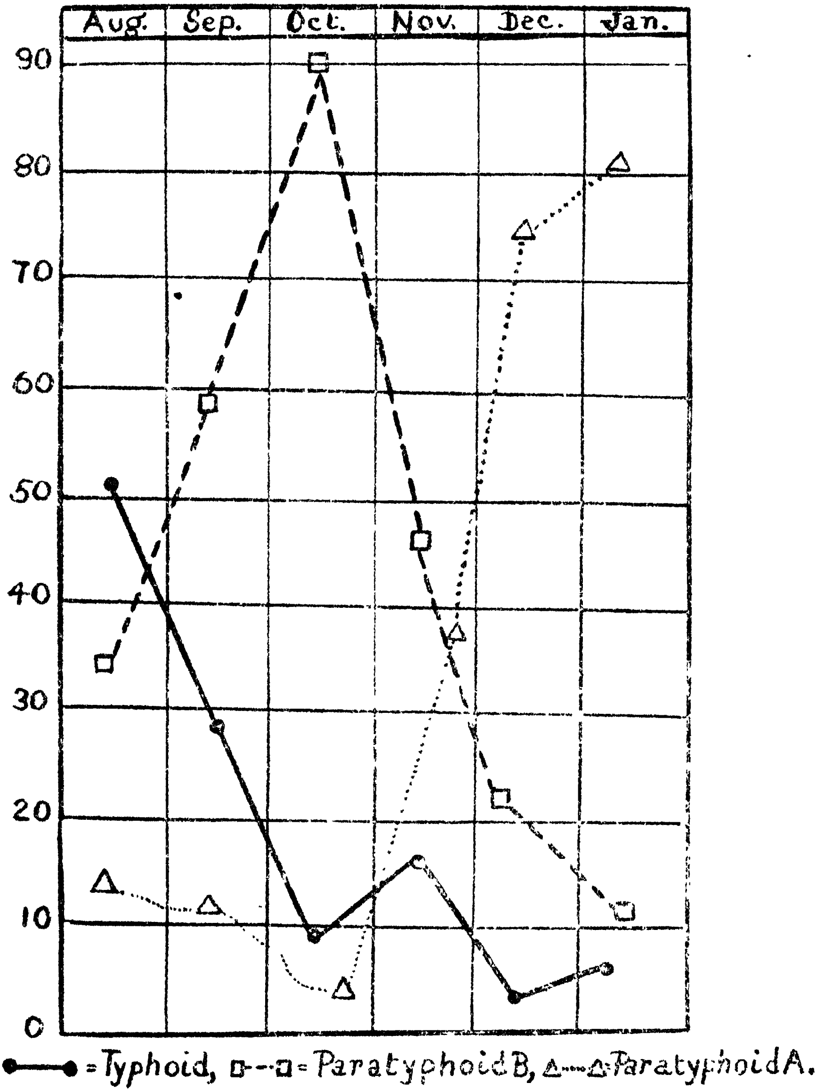

Fig. 1. Chart representing monthly incidence of typhoid, paratyphoid A and paratyphoid B diagnosed by isolation of their respective organisms.

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* Reproduced by permission from the *Journal of the Royal Army Medical Corps*.

Future work will decide. We must "follow the Gleam."

Fig 2.*

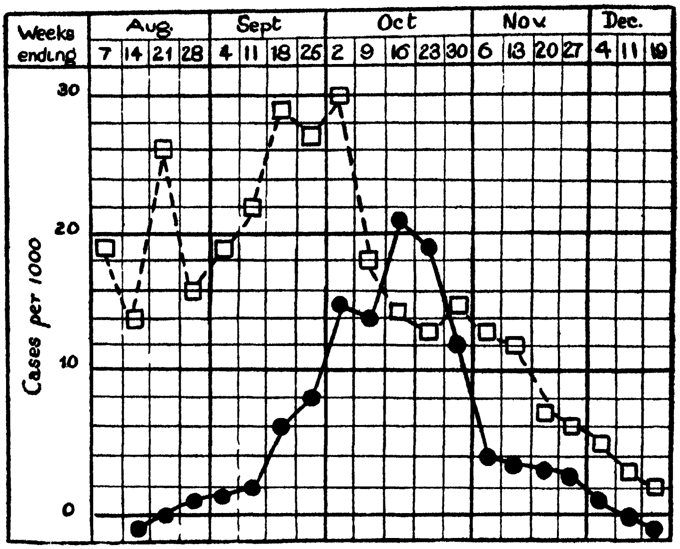


Fig. 2.—Chart showing the incidence-rate of epidemic jaundice and diarrhoeal diseases per 1,000 troops in one division for period August 7th to December 19th, 1915.

One division (*b*) "Diarrhoeal Diseases"
(*a*) "Jaundice" ●——● Diarrhoea ..
Enteritis .. } □···□
Dysentery ..

J. H. Tull Walsh.

Martin (C. J.) & Upjohn (W. G. D.). **The Distribution of Typhoid and Paratyphoid Infections amongst Enteric Fevers at Mudros, October-December 1915.**—*Brit. Med. Jl.* 1916. Sept. 2. pp. 313–316. With 1 fig.

The authors are working as pathologists to No. 3 General Hospital "A.I.F.," as officers of the "A.A.M.C." The following are the essential clauses:—

"During the three months October to December, 1915, we gathered a considerable amount of data, which we shall proceed to deal with, in view of its bearing upon the distribution of enteric fevers at Gallipoli. . . ."

"We were aware that the interpretation of agglutination results would, in the case of persons inoculated against typhoid, be a matter of some difficulty; but we had the advantage of working in close co-operation with our physicians, who kept us in touch with the subsequent history of the patients. . . ."

"The emulsions were, in the first instance, made from strains of typhoid, paratyphoid A, and paratyphoid B bacilli obtained from the Lister Institute. The first is a readily agglutinable strain, which has been propagated in the laboratory for several years. The two last are descendants of Schottmueller's original strains. Subsequently we substituted a locally isolated strain of *B. paratyphosus* B, as the Schottmueller's strain did not form good emulsions. . . ."

---

*Reproduced by permission from the *Journal of the Royal Army Medical Corps.*

TABLE 1.

	No agglutination (minimal dilution of serums 1 in 50 or 1 in 100) ..	163–163
	Agglutination to B. *typhosus*	138–138
	Agglutination to *B. paratyphosus* A	66
Co-A.	,, ,, *B. paratyphosus* A and *B. typhosus*	136
	,, ,, ,, ,, ,, and *B. paratyphosus* B (last slight or transient) ..	9
	,, ,, *B. paratyphosus* A and *B. paratyphosus* B (latter slight or transient)	2–213
	Agglutination to *B. paratyphosus* B	19
Co-A.	,, ,, *B. paratyphosus* B and *B. typhosus*	88
	,, ,, ,, ,, *B. typhosus* and *B. paratyphosus* A (last slight or transient) ..	5
	,, ,, *B. typhosus* and *B. paratyphosus* A (latter slight or transient)	1–113
		627

"The 163 instances in which the serum gave no agglutination in the minimum dilution used—1 in 100—may be summarily dismissed, as they furnish no information. They comprise cases in which the serum was sent for examination too early in the disease, and others in which the subsequent clinical history indicated that the patient was suffering from some disease other than one of the enteric fevers."

There remain 464.

"Of these, 213 serums agglutinated *B. paratyphosus* A, and are for reasons given above [higher dilution], regarded as significant of paratyphoid A infection. For parallel reasons we regard 113 as infections by paratyphoid B.

"The determination of the number of typhoid infections is not so simple.

"The 138 cases in whose serums only typhoid agglutinins were discovered were not necessarily typhoid fevers, for all but five of the patients had been inoculated. These five exceptions we place to the credit of typhoid infections on the agglutination findings. In seven other cases we succeeded in isolating *B. typhosus* from the blood or excreta either during life or after death, leaving 126 cases in which the serological observations might be interpreted either by previous inoculation or by recent infection."

To determine the amount of agglutination due to inoculation "the blood of members of the staff and hospital orderlies, who had not been sick, was examined under similar conditions to those employed in the case of patients:—

7	agglutinated in a dilution of	1 in 800
12	,, ,, ,, ,, ...	1 ,, 400
22	,, ,, ,, ,, ...	1 ,, 200
16	,, ,, ,, ,, ...	1 ,, 100
18	did not agglutinate in a dilution of ..	1 ,, 100

"In addition to the above experiment, the pooled serum of twenty-eight men inoculated on the same day fourteen months previously was found to give a good agglutination at 1 in 200—a result in close agreement with the above."

Excluding cases which gave reaction but were suffering from other diseases, also 35 cases of epidemic jaundice, there remain 91 cases.

These "were either investigated at the time or their records carefully scrutinized for us by Lt.-Col. Stawell, consulting physician to our unit. . . . Without his assistance in this matter it would not have been possible to draw what is perhaps the most important conclusion from our observations—namely, the relative prevalence of true typhoid fever at Gallipoli. After submission to his scrutiny, these 91 cases which might possibly have been typhoid infections were reduced to 13. This number includes all those which, on clinical grounds, might have been cases of one or other of the enteric fevers. It is certainly a maximal estimate, for, as mentioned above, we have reason to believe that some cases of paratyphoid A fever, which the method we employed failed to discover, are included in it."

[Even less than 1 in 50 is diagnostic of paratyphoid A infection.]

"The results of the analysis of our observations after this eliminative procedure had been applied to the cases whose serums agglutinated only *B. typhosus* are as follows :—

Cases of typhoid fever	25	 7	per cent.
„ „ paratyphoid A	213	 61	„
„ „ „ B	112	 32	„
	350		

"As soon as we became aware from our observations that the great proportion of the cases of enteric fevers amongst Australian troops was due to paratyphoid infections, we represented the facts to the Director Medical Services of the Commonwealth forces and advised that Australian troops should be at once inoculated with a vaccine containing paratyphoid and typhoid bacilli. . . . Early this year all Australian units were so inoculated."

[J. H. T. W.

Fildes (P.). The Duration of the Immunity following Antityphoid Inoculation.—*Jl. Roy. Nav. Med. Serv.* 1916. July. Vol. 2. No. 3. pp. 311–312.

This short, concise and well-written paper is the work of the Assistant Bacteriologist to the London Hospital, working at the Royal Naval Hospital, Haslar. Only necessary facts and conclusions are given; there is no padding.

"The men here referred to were admitted from the Eastern Mediterranean between December, 1915, and February, 1916, in a state of convalescence after various forms of bowel disease. . . ."

"The series consists of 1,035 men, of whom 106 were not inoculated and 929 were inoculated. The uninoculated included twenty-seven cases of typhoid fever (25 per cent.), while among the inoculated were 104 cases (11 per cent.). . . ."

"It is therefore clear that the incidence of typhoid per cent., was more than twice as great among the uninoculated as among the inoculated. The effect of the inoculation is still more marked if the men are arranged according to the length of time which has elapsed since inoculation :—

					Per cent.
"929 men inocu-lated	321 inoculated	within 6 months	had 14	cases of typhoid	= 4·3
	421 „	„ 7–12 „	„ 52	„ „ „	= 12·3
	187 „	„ 13–18 „	„ 38	„ „ „	= 20·3.

"When these figures are compared with those relating to the uninoculated, it is seen that after twelve months the incidence of the disease among the inoculated (20·3 per cent.) is almost as high as among the uninoculated (25 per cent.)."

"Conclusions.

"(1) By the methods of inoculation in use in the Navy the incidence of typhoid may be reduced in the proportion of three to one in the first year after inoculation.

"(2) After one year no material protection is given.

"(3) Every man should be reinoculated against typhoid every twelve months if he is exposed to infection."

J. H. T. W.

de MELLO (Froilano), BORCAR (Atmarama) & de SOUSA (Loreto). **Contribution à l'étude des fièvres remittentes de l'Inde Portugaise.** —*Anais Sci. da Faculdade de Med. do Pôrto.* 1916. Vol. 3. 41 pp.

The author points out that since the outbreak of the "Great War" our knowledge of enteric fevers has greatly increased. Owing to certain atypical clinical signs a group of "fevers," not uncommon in Portuguese India and other parts of Asia, were not readily recognised and were, for want of accurate knowledge, called "nervous fever," "remittent fever," or "climatic fever." Uncertainty breeds curiosity in the scientific mind and leads to investigation. Dr. De Mello determined to classify such fevers occurring in Portuguese India. He emphasises the importance of accurate laboratory work and the paramount importance of blood-culture. Attention had previously been called to these atypical "fevers" by the author in 1914 at the All India Sanitary Conference, Lucknow; and, also in a "paper" read at La Première Conférence Sanitaire de l'Inde Portugaise. Research has shown that many of these "fevers" are due to one or other of the *Enterica* group of bacilli. Although these records contain little that is new the work has been well done. Twelve cases are recorded with full clinical details, with temperature charts, etc. Mortality tables for 1912, 1913 and 1914 are given and there are tables of bacteriological findings and provings, on culture media and with agglutination tests.

The author in chief concludes with the opinion that "the remittent or climatic fevers of Portuguese India, although existing as a clinical type, cannot be considered as having the origin attributed to them before the institution of laboratory studies in this country; and until positive reasons are shown to the contrary, one must presume that they are only infections due to the typho-paratyphoid group."

On page 17 of the pamphlet it is stated that "recent studies have shown that the reaction of Widal, although a sign of typhoid infection, has not, however, great value when employed for differential diagnosis between typhoid and paratyphoid." This question has been noticed and dealt with by COURMONT, CHATTOT and PIERRET [see below, page 14].

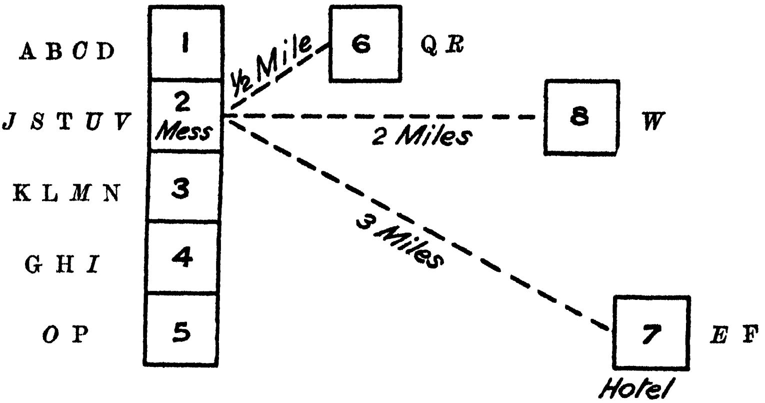
J. H. T. W.

KEYWORTH (W. D.). **Diarrhoea and Continuous Fever due to Oysters.**—*Indian Med. Gaz.* 1916. Aug. Vol. 51. No, 8. pp. 286–292. With 1 diagram.

This is a record of "the effect of an article of diet heavily infected with *Bacillus typhosus* on a community mostly inoculated against enteric."

The cases of infection occurred during February and March 1914 and, although in his own person Captain Keyworth, I.M.S. "escaped with a mere attack of diarrhoea," he was among the victims. The infection was traced to a dinner party given at Poona. Twenty-two persons were present at the feast. "Of these twenty-two persons eighteen had eaten oysters, six being subsequently ill with diarrhoea and five with continuous fever."

DIAGRAM OF BUNGALOWS.



Note.—The numbers given to the bungalows are the serial numbers used in the text.

The letters represent the officers, adult relatives, and guests living (*i.e.*, occupying quarters) in the respective bungalows.

Individuals attacked in the original outbreak are shown in italics.

"E" "F" were the only individuals connected with the Regiment living in the hotel. There were of course other residents.

When these cases occurred "Poona Cantonment was practically free from intestinal disease." From the persons attacked it was evident that the cause of infection must be sought in some "esurient day" on which they had met to dine together. Such an opportunity for eating possibly infected oysters was to hand in the "dinner party at which twenty-two persons had been present" on January 6th, 1914. Those who did not eat the oysters did not suffer.

The "Summary" and "Diagram" give all necessary details; but it will be of interest to give an extract from Captain Keyworth's paper which shows the relation between the infections recorded and the antecedent antityphoid inoculation:—

"A glance down columns 3 and 4 of the table reveals the fact that only three persons 'I' 'S' and 'W' . . . were not protected," either by a previous attack of enteric fever or by protective vaccination.

"These three were all ill with continuous fever and they were the only ones of the whole series that had fever of any considerable duration. The protected suffered also but to quite a different degree. Thus the protection afforded by previous enteric or by inoculation was definite though only relative."

A report made by Major HARVEY, R.A.M.C., in connection with the "Poona" outbreak showed that, as regards Bombay oyster beds, "the grossest contamination was a matter of almost daily occurrence!"

J. H. T. W.

Summary of results in tabular form.

Serial letters.	Rank or Description.	Inoculated.	Previous Enteric.	Oysters on January 6th.	Diarrhoea.	Fever.	Agglutination *B. typhosus.*	Agglutination *B. Para A.*	Remarks.
A	Captain	—	+	+	—	—	+1/20	+ 20	....
B	Wife of A	+ 1/12	—	—	—	—	+1/20	±1/20	....
C	Colonel, brother of A	?	?	+	+	—	not examined		Diarrhoea for 7 days commencing Jan. 7th Sailed for England, Jan. 9th (C & D)
D	Wife of C	?	?	?	—	—	not examined		
E	Colonel (Commandant)	+24/12	—	+	—	+	—	+1/200	10 days' fever, commencing January 29th. Blood culture 7th day negative.
F	Wife of E	+18/12	—	—	—	—	—	—	....
G	Major	—	+	+	—	—	—	—	....
H	Major	+ 6/12	—	+	—	—	—	—	Ill with fever and diarrhoea for 7 days in March 1914, probably infected from I.; not included in original outbreak.
I	Wife of H	—	—	+	—	+	refused examination.		Fever for 4 weeks commencing January 15th, ambulatory case of enteric or paratyphoid, refused treatment.
J	Major	+24/12	+	+	—	+	1/100	—	10 days low fever commencing January 26th, ambulatory case, never went sick.
K	Captain	—	+	+	—	—	—	—	....
L	Wife of K	+ 3/12	—	+	—	—	+1/20	—	....
M	Lady staying with L	+ 2/12	—	+	+	—	—	—	Mild dysentery for 10 days, commencing Jan. 7th.
N	Lady staying with L	+ 2/12	—	+	+	—	+1/100	—	Diarrhoea for 6 days commencing January 7th.
O	Captain	+ 1/12	—	+	+	—	+1/20	—	Slight diarrhoea on Jan. 7th and 8th.
P	Wife of O	+ 1/12	—	—	—	—	+1/20	—	....
Q	Captain	+24/12	+	+	—	—	+1/40	—	Dyspepsia 7 days commencing January 22nd.
R	Sister of Q	+ 6/12	—	+	—	+	—	—	Fever for 10 days commencing January 29th; B. Faecalis Alkaligenes recovered from stools.
S	Captain	—	—	+	—	+	±1/200	—	Enteric of moderate severity commencing January 28th; B. Typhosus recovered from blood on 6th day.
T	Captain	+24/12	—	+	—	—	+1/20	—	....
U	Subaltern	+24/12	—	+	+	—	+1/20	—	Diarrhoea for 3 days commencing January 7th.
V	Medical Officer	+18/12	—	+	+	—	±1/100	—	Diarrhoea for 4 days commencing January 7th.
W	Civilian resident in Poona	—	—	+	—	+	+1/40	—	Severe enteric commencing January 15th.

Note.—The numerals in column 3 represent fractions of a year since last inoculation or re-inoculation.

CHALMERS (Albert J.) & MACDONALD (Norman). **An Enteric-like Fever in the Anglo-Egyptian Sudan.**—*Lancet.* 1916. July 22. pp. 139–144.

The authors consider that they have discovered a new type of enteric fever with a new causative bacillus, to which they have given the name *B. khartoumensis* Chalmers and Macdonald 1916. Little is said about the disease, very much about the bacillus!

The following extracts from the authors' report will enable readers to form an opinion as to the value of the discovery.

The number of cases treated is not given, but the organism, regarded as a new species, was isolated from only three of them:—

An organism "which by agglutinating with the patient's serum during the later stages of the illness appeared to be the causal factor, while its cultural and biochemical reactions indicated that it belonged to the Typhoid-Colon Group."

"After a preliminary period of from 1-3 days during which the patient suffers from headache, constipation, and malaise, with marked (Chart 1) or slight fever (Chart 2), the febrile attack sets in gradually, being associated with marked constipation and headache and a disinclination for mental or bodily work, and with all the usual signs and symptoms of a mild attack of typhoid fever. . . . As no organism could be found in the blood it must be concluded that *no marked septicaemia* could have been present, by which of course it is not meant that large quantities of blood—e.g., 10 cc.—might not have shown an organism, but unfortunately it did not occur to us to use more than small quantities, 1 to 2 cc. of blood, as usual well diluted with broth."

"The mortality was nil." The bacillus was obtained from the faeces and at the end of 24 hours showed on Drigalski-Conradi plates "bluish clear dew-drop colonies varying in size and regular in outline lying between the typical colon colonies." "On Fawcus's medium they appeared at the end of 24 hours as clear colonies regular in outline and varying in size lying among the typical colon colonies."

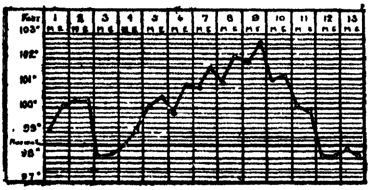
These colonies contained "non-motile, Gram-negative bacilli which fermented lactose in liquid media with production of acid and gas, and in subcultures produced red colonies on MacConkey's bile salt lactose agar." With the patients' serum this bacillus agglutinated "in dilution of 1 in 50 and less completely in 1 to 100. Eberth's bacillus and the paratyphoid bacilli were not agglutinated."

[This does not exclude the possibility that the bacillus is an atypical *B. paratyphosus* A, which even when typical always shows a very low titre with a patient's serum and often gives no reaction with such serum, although an undoubted A–bacillus, agglutinated by a specific serum, has been isolated by blood culture.]

"It agglutinated with a specific paratyphoid A serum in a dilution of 1 in 50"; 1 in 100 was feeble and in 1 in 1,000 absent. "As this serum completely agglutinated the laboratory strain of *B. paratyphosus* A up to 1 in 10,000 in one and a half hours and also completely agglutinated in dilution up to 1 in 5,000 and less completely 1 in 10,000 an organism giving the reactions of *B. paratyphosus* A, and recently isolated from a case of fever in Port Sudan, we conclude that it was in good condition!"

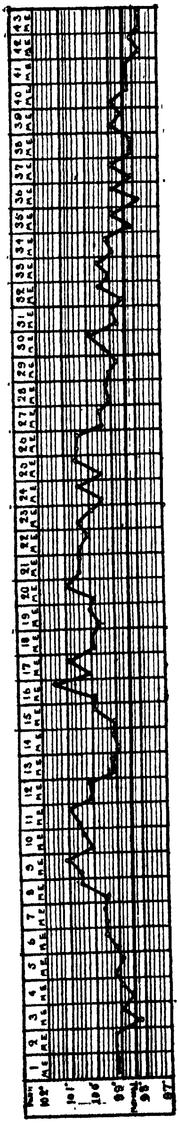
Morphology, staining conditions and biochemical reactions are given in great detail and the genealogies of many bacilli are graphically stated.

CHART 1.*



This chart illustrates the precursory fever which may occur before the real attack, and also a typical attack without a relapse.

CHART 2.*



In this chart there is but slight precursory fever, while the real attack ends on the fourteenth day and is followed by a relapse.

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* Reproduced by permission from the *Lancet*.

[This bacillus and the disease it produces may be new as affirmed but so many atypical bacilli related to those of the genus *Enterica* and also to *Dysenteriae* and to *Coli* have been described that, before accepting the specific rank of *B. khartoumensis*, it would be well to wait until this report is confirmed by others (cf. SARRAILHE and CLUNET (2 notes); SVESTKA; ARCHIBALD, HADFIELD and others, *Bulletin* Vol. 8, pp. 73 & 89; also COURMONT, CHATTOT and PIERRETT, ARCHIBALD, HADFIELD and others (this Number). Clinically the disease resembles paratyphoid A fever.]

J. H. T. W.

von WILUCKI. **Paratyphus abdominalis B geheilt durch Bolus alba.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1916. June. Vol. 20. No. 12. pp. 265–267. With 2 charts.

In Vol. 19, No. 12 of the same journal for the year 1915, Dr. v. Wilucki had reported 33 cases of paratyphoid B infection which he treated with "Bolus alba" with good results. The doses given in those cases were:—150 gm. daily for the first few days, then 100 gm. three times a day for five days. Sufficient water was added to make the dose potable. As a rule the patients soon became accustomed to the taste; but in some cases it was necessary to give the drug in milk, tea or coffee. Occasionally the treatment produced constipation.

The case recorded in Vol. 20 occurred also on board S.M.S. "Posen," in February, 1916, and was treated in the same way with "Bolus alba." The effect produced was very marked in this case:—The temperature fell, the number of stools was reduced and on recovery the intestines were free from *Bacillus paratyphosus* B.

The sources of infection on the "Posen" which might have started the epidemic in 1915 were:—Water tanks; carriers (cooks, etc.); and the ship's dog whose dung contained *B. paratyphosus* B. The case reported in Vol. 20 was not followed by any others and Dr. v. Wilucki suggests that the infection in this instance may have come from the ship's dog. *B. paratyphosus* B is considered to be a possible cause of "distemper" in dogs, and the bacillus also lives in the dog's intestines as a saprophyte. The patient was a "sweeper" and it was his duty to remove, with other refuse, the dog's excrement. Harmless as a rule in the intestine of the dog the bacillus becomes harmful in a different environment, the human gut, where it produces toxins which are pathogenic. The bacillus does not change, but the chemical substances produced are different.

J. H. T. W.

COYON (Am.) & LEMIERRE (A.). **Valeur comparée du séro-diagnostic des fièvres typhoïdes et paratyphoïdes chez les sujets vaccinés et les non-vaccinés contre la fièvre typhoïde.**—*Bull. et Mém. Soc. Méd. des Hôpit. de Paris.* 1916. July 27. 3 ser. Vol. 32. No. 25–26. pp. 1209–1221. With 8 charts.

This is an interesting record and worthy of notice although similar work has been done by others, mainly by macroscopic methods of diagnosis [see this *Bulletin*, WADE & McDANIEL; DYER, Vol. 6, p. 23; PORCELLI-TITONE; REISS, Vol. 7, pp. 46-47].

Coyon and Lemierre rely on a microscopic method on lines laid down by WIDAL and SICARD :—

"The mixtures of serum to be examined, and of emulsion in peptone water of bacillary cultures, of 24-hours growth on agar, are made, in progressively increased dilutions, in a series of watch glasses. One drop, taken from each glass and placed on a slide, can be examined during each minute of the experiment and compared with a drop of the control pure-culture. Below 1 : 100 the reaction is not considered positive unless produced during the first half-hour. Above 1 : 100 we only recognize the agglutinations that take place during the first two hours."

"This process enables one not only to measure the agglutination titre, but also to appreciate the rapidity of the massing of the microbes and the aspect of the clumps."

As the outcome of their investigations the authors arrive at the following conclusions :—

"1. The introduction of anti-typhoid vaccination has not diminished the practical value of serum-diagnosis by agglutination when applied to the diagnosis of typhoid and paratyphoid fevers."

"2. Microscopic sero-diagnosis and measurement of agglutination titres as used by Widal and Sicard remains the method of choice, capable of guarding against errors due to paradoxical or atypical agglutinations, generally rare."

"3. Anti-typhoid vaccination leaves in the serum of numerous individuals powers of agglutination with Eberth's bacillus, which may reach, even after a long period of time, a titre of 1 : 100 or even 1 : 200. It is only when the dilution is much greater than 1 : 200, and agglutination of high titre with *B. paratyphosus* A or *B. paratyphosus* B is absent, that we may conclude that vaccinated persons are suffering from an attack of typhoid fever."

"4. The persistence of such agglutination in vaccinated persons does not interfere with serum-diagnosis in patients attacked by paratyphoid infections."

"5. Blood culture, although giving a more reliable diagnosis than serum-diagnosis, is only available early and when a laboratory is within reach."

J. H. T. W.

GAUTIER (C.) & WEISSENBACH (R. J.). **Le diagnostic des infections typhiques et paratyphiques chez les vaccinés et les non-vaccinés, par la séro-réaction de Widal, valeur de l'épreuve de la saturation des agglutinines dans les cas d'agglutinations multiples.**—*Bull. et Mém. Soc. Méd. des Hôpit. de Paris.* 1916. July 27. 3 ser. Vol. 32. No. 25–26. pp. 1344–1375.

Necessary as are the ordinary methods for diagnosis through the phenomena of agglutination the records are so numerous that much of the authors' work calls for no extended notice. On the other hand differentiation by saturation is a difficult and valuable process and new work is welcome [cf. BAINBRIDGE, "Milroy Lectures," *Lancet.* 1912. Vol. 1, pp. 705, 771 and 849].

It is not necessary to reproduce all the details, "tables" and analyses. Full references to previous work are given by the authors.

The chief conclusions are :—

"1. It is indispensable, in all cases, to investigate and to compare *the final titres* of the agglutinating power for each of the three germs T, A, B."

"2. In cases of multiple agglutinations, if the titres of the two or the three agglutinins are in the proportions of 1 : 6, 1 : 7 and above, an investigation of the final titre of agglutinating power is sufficient; the kind of agglutinin giving the highest titre indicates the species of infecting germ."

"On the other hand if the *dilution limits* of the agglutinins are in ratios of 1 : 5, 1 : 4 or approach equality, it may happen that the germ agglutinating most is not the infecting germ. It is the interpretation of such cases that authors find most difficult when they confine their efforts to the testing of final titres only. To avoid all risks of error thay have been led to reject all except high dilutions. They have thus lost the advantages of the serum-diagnosis method precisely in the periods most interesting to the physician:—at the beginning of the illness, if they have not made blood cultures, and in mild infections when blood culture is negative. It is necessary in such instances of multiple agglutinations, with ratios in the neighbourhood of 1 : 5, 1 : 4, etc., to have recourse to proof by the method of saturation of agglutinins. The determination of the *dilution limit* of the agglutinating power of the serum, after saturation if that be necessary, has a value which differs according to the germ in question, the period of disease at which the serum-diagnosis is made, and according to whether the patients are vaccinated or non-vaccinated individuals."

J. H. T. W.

COURMONT (Paul), CHATTOT & PIERRET (R.). **Le séro-diagnostic des infections paratyphiques.**—*Bull. et Mém. Soc. Méd. des Hôpit. de Paris.* 1916. June 16. 3 ser. Vol. 32. No. 19–20. pp. 955–980.

One would think that the evidence in favour of specific agglutination was already sufficient; but it appears that there are still some who doubt. Such a one is M. RIST [Reference not given] who, having examined 216 cases, says:—"As showing that the bacillus of Eberth, or the paratyphoid A, or the paratyphoid B is the cause of a disease the serum-reaction is of no value."

The careful work done by Courmont and his colleagues was undertaken in order to refute the above statement.

"Clinical examination alone cannot differentiate typhoid and the paratyphoid fevers. It is necessary to add: blood culture and serum-diagnosis.

"Blood culture when positive is certain proof; but it has its difficulties:—"

"1. Blood culture is nearly always negative after a certain period of the illness; 2. in mild and abortive cases the bacillaemia is of brief duration."

[Time, therefore, is an important factor in successful blood culture, and this is also insisted on in a "Report" by ARCHIBALD, HADFIELD and others. [See above.] The medium in which the blood culture is made is also of importance, and Captain S. R. DOUGLAS, I.M.S. (retired) and Captain L. COLEBROOK, R.A.M.C. [*Lancet*, July 29, 1916] have reported on the value of broth containing trypsin.

In this connection it is only right to call attention to the work of S. W. COLE and H. ONSLOW (*Lancet*, July 1st, 1916).]

"Diagnosis by comparative agglutination of the three bacilli E, A, B, should be made concurrently with the blood culture, or when that is impossible."

The authors set a high standard and disregarded all agglutinations below 1 : 50 for *B. typhosus* and *B. paratyphosus* A, and below 1 : 100 for *B. paratyphosus* B.

Their conclusions are as follows:—

"The comparison of the results of positive blood culture and serum-diagnosis in 109 cases of typhoid or paratyphoid fever lead us to the following conclusions:—

"1. The serum-diagnosis of the paratyphoids by comparative agglutination of the bacilli A and B keeps all its value in subjects not vaccinated against those bacilli (even if they are vaccinated against Eberth's bacillus) if our rules of technique and practice are followed (especially the use of bacilli of marked agglutinability and the search for agglutinations of high titres capable of showing predominance of specific agglutination).

"2. The sero-agglutination of Eberth's bacillus in vaccinated persons has no great diagnostic value; it must not be taken into account when appearing concurrently with sero-diagnostic appreciations of paratyphoids.

"3. The results of serum-diagnosis have been nearly always concordant with those of blood culture. The chances of error due to paradoxical agglutination of a bacillus not present in the infection have been extremely small; three cases only in 109 (2·8 p. 100), and in two of these cases agglutination subsequently appeared to rectify the possible error.

"4. Coagglutinations were nearly always absent, or were temporary, or greatly inferior to the agglutinations of the bacillus revealed by the blood culture. The repetition of the serum reactions with higher dilutions removed nearly always the possibility of mistakes.

"5. The case of paradoxical agglutination may sometimes be explained by a recent infection by a paratyphoid bacillus other than the one revealed by the blood culture (case of successive infection by the bacilli B and A). The agglutination is thus a faithful witness of infections recent or co-existent."

"6. The agglutination of the infecting bacillus rises especially at the end of the illness, and coagglutinations ordinarily disappear at this period; it is at this time that comparative serum-reactions will give the most valuable indications."

"7. Respective values of the agglutinations E, A, B:—

> "(*a*) *Agglutination of bacillus A.*—It is often absent (33 p. 100) or retarded, but we have only encountered (starting from 1 : 50) two cases in 109 where it occurred other than with A in paratyphoid and then with a titre lower than that of the infecting bacillus. A positive serum reaction with A has a very great value, while its absence, by itself, does not disprove the presence of paratyphoid A. It even suggests paratyphoid A when the reaction is negative, since the agglutinations of E or B are nearly always positive at some time during the illness. The research should be continued into [and beyond] the convalescence.
>
> "(b) *Agglutination of bacillus B.*—Exists nearly always in paratyphoid B (88 p. 100) and often at very high titres; but we have found it predominant during the course and especially at the beginning of some infections of E or A (3 cases in 109, or 2·8 p. 100 agglutination of B, starting from 1 : 100).
>
> "(c) *Agglutination of Eberth's bacillus.*—In non-vaccinated persons the value of the reaction remains good; we have only found it in diseases due to Eberth's bacillus. In vaccinated persons it would give rise to frequent errors if given its full and ordinary value; it would have given us 33 p. 100 of error in cases of paratyphoid A, and 27 p. 100 with para- B a figure reduced to 9 p. 100 only, on repeating the serum reactions."

"8. *Application of serum diagnosis alone.*—It enabled us to make a diagnosis in 101 cases, say 78 p. 100 (24 typhoid fever, 25 para-A and 52 para-B)."

J. H. T. W.

GLYNN (Ernest) & LOWE (E. Cronin). **Serum Reactions of 300 Unselected Cases of "Enteric" with the Oxford Standard Agglutinable Cultures.**—*Lancet.* 1916. Aug. 5. pp. 222–227.

DREYER's technique was employed according to "Directions for the use of standard agglutinable cultures, Department of Pathology, University of Oxford, on behalf of the Medical Research Committee."

Readings were taken "in a cupboard, with a black background, containing an electric lamp," in which standard records can be made by day or night.

The chief "Conclusions" are as follows:—

"After making about 3,000 tests of these and other cases we find the emulsions most satisfactory, giving quite clear and definite readings, and the technique so simple that it can be easily mastered by an intelligent attendant. . . .

"The only practical difficulty—viz., that of obtaining sufficient blood—was overcome by instructing the ward sisters how to fill specially made Wright's capsules.

"Control sera of soldiers inoculated against typhoid, but suffering from dysentery or surgical diseases, failed to agglutinate either paratyphoid emulsions, but the serum of every convalescent, 12 in all, excreting paratyphoid A or paratyphoid B bacilli agglutinated the corresponding emulsion only in titres ranging from 25 to 250. . . .

"The remarkable diminution and frequent disappearance of the paratyphoid 'infection' agglutinins which usually occurred formed a marked contrast to the stationary typhoid 'inoculation' agglutinins. This is partly explained by supposing that the typhoid vaccines were made from strains of bacilli specially selected on account of their capacity to form quantities of 'inoculation' agglutinins.

"*Co-agglutination.*—(*a*) Between paratyphoid A and B or *vice versa* co-agglutination did not occur with the Oxford emulsions, in convalescence at any rate; only three sera out of 600 have agglutinated A and B simultaneously; in two paratyphoid vaccine had been used. (*b*) Typhoid infection or vaccine produced titres from 250 to 5,000 without agglutination of paratyphoid. (*c*) Paratyphoid B infection, though not paratyphoid A infection, certainly raised the titre of typhoid inoculation agglutinins. It was remarkable, however, that the paratyphoid B titre usually fell while the typhoid persisted, apparently the paratyphoid B infection stimulated the tissues already engaged in the formation of typhoid agglutinins to repeat the sudden rise and gradual fall which followed the typhoid vaccine.

"The paratyphoid A titre averaged a lower level than that of paratyphoid B after infection and after vaccine, partly perhaps because the paratyphoid A emulsions used to demonstrate the presence of agglutinins were relatively less sensitive. Consequently [as has been frequently noticed] a low paratyphoid A titre is the more significant; Dreyer, in fact, states that an agglutination of 1–10 paratyphoid A is diagnostic. . . .

"Our serological tests independently confirm what Archibald found by blood cultures—viz., that in the Eastern Mediterranean paratyphoid B infections were commoner than paratyphoid A until November [1915], after which the reverse obtained. This change in incidence was probably due to the introduction of paratyphoid A carriers with the battalions from India."

[The macroscopic method known as "Dreyer's method" has generally proved reliable and might be accepted as a standard for such sero-agglutinations. A simple, easy, microscopic method, workable almost anywhere, is that recommended by COLES—this *Bulletin*, Vol. 8, p. 102.] J. H. T. W.

NOBÉCOURT (P.) & PEYRE (E.). **Résultats des hémocultures pratiquées chez 375 malades du service des contagieux de F. . .**—*Bull. et Mém. Soc. Méd. des Hôpit. de Paris.* 1916. June 2. 3 ser. Vol. 32. No. 17–18. pp. 813–830.

Three hundred and seventy-five patients admitted to a hospital for infectious diseases were tested by blood culture for the presence of bacteria. 10 cc. of blood, taken from the median vein of the forearm, were added to 40 cc. bile-bouillon (1/3 bile). 152 were positive; 223 negative. Of the 152 positive results 142, when the bacilli were isolated and identified, showed:—23 *B. typhosus;* 79 *B. paratyphosus* A; and 40 *B. paratyphosus* B.

Among the cases that gave negative results there were patients suffering from typhoid and paratyphoid fevers as shown by clinical symptoms and agglutination tests. When bacilli were found in the blood they were identified by the following technical methods :—

"*B. typhosus*: mobile bacillus; Gram-negative; general cloud with wavy silky growth in bouillon; no appreciable evolution of gas in glucose or lactose carbonated bouillon; no bubble of gas, no discoloration, no fluorescence in glucose agar neutral red stab culture; no gas, brown coloration in glucose agar with subacetate of lead; agglutination with a specific serum."

Out of the 23 persons suffering from this disease and giving as stated a positive blood culture 15 had previously received anti-typhoid vaccine.

"*B. paratyphosus* A: motile bacillus; Gram-negative; general cloud with silky wavy colonies in bouillon; evolution of gas in carbonate, glucose bouillon but not in lactose bouillon; greenish to yellow tint in lower three-quarters of stab culture in glucose agar with neutral red [after a few days this colour is replaced by red showing a secondary acid reaction]; production of gas but no darkening of glucose agar with acetate of lead; agglutination by a specific serum."

"*B. paratyphosus* B: Differentiated from *B. paratyphosus* A by the appearance of a blackish colour in the glucose agar with sub-acetate of lead and by agglutination by a specific serum."

This bacillus causes a yellow colour with greenish fluorescence in the "neutral red" medium; the colour is permanent as *B. paratyphosus* B is an "alkaline" bacillus. With regard to *B. paratyphosus* A it would seem to differ from the other two members of the "Enterica" group in that it forms "Small reddish colonies" on Endo's fuchsin plates [cf. SVESTKA. *Bulletin*, Vol. 8, p. 99]. On Drigalski-Conradi "crystal-violet" plates all three show pale blue colonies.

J. H. T. W.

COSTA (Fernando). **L'hémoculture dans l'eau et l'hémoculture en bile dans le diagnostic de la fièvre typhoïde.**—*Arquivos Inst. Bact. Camara Pestana.*—1916. Vol. 4. No. 3. pp. 292–296.

This research was undertaken in order to compare the methods of CONRADI and KAYSER with the method recommended by GILDEMEISTER in 1910 :—

"The diagnosis of typhoid fever by bacteriological methods attained its maximum of perfection and certainty in 1905–1906 when Conradi first, and then Kayser, adopted culture media containing glycerinated bile, or bile simply sterilized."

"0·5 to 2·5 cc. of blood were taken from a patient and placed at once in a 5 cc. tube of sterilized ox bile incubated at 37° C. for 12 to 24 hours and then sown on plates [Drigalski, Endo or other], repeating the process 12 to 24 hours later if the first plates show no growth."

"Kayser published his first work on 125 cases with 100 per cent. positive results during the first week of the illness; 60 per cent. in the second, 48 per cent. in the third and, finally, 33 per cent. in the fourth and fifth weeks."

Others repeated the experiments with similar results.

"In January 1910 Gildemeister proposed sowing the blood not in bile, but in distilled water or even any ordinary water. The method consists in adding the freshly taken blood, or clot ground up minutely, to eight or ten times its volume of distilled water and shaking it forcibly. The tube is incubated at 37° C. and one hour later again forcibly shaken; 12 to 24 hours later the fluid is sown on plates as in Kayser's method."

"The relative value of the two methods as resulting from our observations is even better shown when these are grouped according to the time at which the blood was taken. Here are the results by weekly periods :—

Direct Blood Culture.

	1st week (9 cases).		2nd week (13 cases).		3rd week (5 cases).	
	Positive.	Negative.	Positive.	Negative.	Positive.	Negative.
In Bile ..	9	0	11	2	3	2
In Water .	7	2	9	4	2	3

Planting of Clot (24 *to* 48 *hours after extraction of blood*).

	1st week (6 cases).		2nd week (9 cases).		3rd week (2 cases).	
	Positive.	Negative.	Positive.	Negative.	Positive.	Negative.
In Bile minutely divided .	4	2	8	1	2	0
In water minutely divided .	4	2	5	4	1	1

"Conclusion : Blood culture in sterilized distilled water or even in spring water, in the proportion of one part of blood to four of water, is an extremely practical method for bacteriological diagnosis of enteric and similar affections. Its results are, on the whole, inferior to those obtained by blood culture in bile."

J. H. T. W.

LABBÉ (Marcel) & CANAT (Georges). **La bileculture chez les typhiques.**—*C. R. Soc. Biol.* 1916. July 22. Vol. 79. No. 14. pp. 668–670.

Bile was obtained by aspiration from a number of patients suffering from one or other of the enteric fevers. When incubated cultures of *B. typhosus* or one or other of the paratyphoid bacilli appeared.

The authors say that "bile-culture offered a diagnostic method of considerable value in three cases when blood culture, copro-culture and serum-diagnosis had failed."

J. H. T. W.

ACHARD (Ch.). **Expériences sur l'infection mixte par le bacille d'Eberth et le bacille paratyphique B.**—*C. R. Soc. Biol.* 1916. July 29. Vol. 79. No. 15. pp. 751–752.

The author recounts some experiments on rabbits and guinea-pigs with intravenous injections of mixed cultures of *B. typhosus* and *B. paratyphosus* B, 1/2 or 3/4 of the former to 1/2 or 1/4 of the latter. When the animals were killed blood from the heart was planted in bouillon. From the guinea-pigs bile was also taken and cultures were obtained. The bacilli grown were identified by use of "Neutral-red, glucose agar," and "glucose bouillon in anaerobic tubes." It was then found that in every case the bacillus obtained was *B. paratyphosus* B, even in cases where the injected material contained only 1/4 of those germs.

J. H. T. W.

TIDY (H. L.) & DUNN (I. P. S.). **On the Differential Bactericidal Values of Malachite and Brilliant Green for the Typhoid-Coli Group.** —*Jl. Roy. Army Med. Corps.* 1916. Oct. Vol. 27. No. 4. pp. 482–494.

It will suffice to give the outlines of this long paper, full of technical details.

The authors, officers in the R.A.M.C., discuss the difficulties present in all methods of isolating *B. typhosus*, which lie mainly in the power which *B. coli* exercises in suppression of *B. typhosus*. Their researches show that when brilliant green is added to the culture media it induces "a pure growth of *B. typhosus*; in the absence of the dye a preponderance of *B. coli* in the proportion of three to one was obtained."

"Comparing these results with those afforded by an identical series of experiments with malachite green, the inferiority of the latter to brilliant green as an enhancing agent was manifest." Similar comparative researches were carried out with *B. paratyphosus* A and *B. paratyphosus* B. "In fifteen cases *B. paratyphosus* A, and in eleven cases *B. paratyphosus* B was isolated from brilliant green when the broth cultures were negative."

J. H. T. W.

WHITHAM (Jay D.). **Paratyphoid Infections.**—*Milit. Surgeon.* 1916. Nov. Vol. 39. No. 5. pp. 491–496.

In this record the author, a captain in the U.S. Army Medical Corps, gives us a general review of present-day knowledge of the infections due to bacilli of the Enterica group known as *B. paratyphosus* A, and *B. paratyphosus* B.

The early historical paragraphs lead up to the bacilli, their nature and properties, and show that they "occupy an intermediate position between typhoid and colon bacilli." As regards their pathogenicity for animals the author writes:—

> "Typhoid bacilli are not very pathogenic for guinea-pigs and mice, but paratyphoid organisms are extremely so, one-hundredth of a loopful of *B. paratyphosus* causing death when injected intraperitoneally. Of the two paratyphoid organisms the B is much more common and wide-spread."

The morbid anatomy resembles that found in typhoid infections, but with certain differences. "Thus the large intestine is more extensively involved than is ordinarily the case with enteric [typhoid] fever."

A list of the symptoms is given according to percentage:—

1. Headache	85%
2. Diarrhoea	55%
3. General abdominal pain	35%
4. Aching in the limbs	30%
5. Mild intermittent shivering	25%
6. Extreme general weakness	25%
7. Backache	25%
8. Epistaxis	20%

Referring to the methods of infection the author writes:—

> "The *modus operandi* of infection . . . resembles typhoid . . . the organisms escape from the bodies of carriers chiefly by means of the feces and can infect food and drink, directly or indirectly, through the agency of

flies. So by means of infected hands or contaminated food, the organisms gain entrance to the human host. The more important vehicles are water, milk, oysters, shellfish, dried fish and uncooked vegetables. Dust, and clothing infected with human excrement, must also play a prominent rôle in the transmission of the disease."

Protective vaccines are accepted as in the case of typhoid fever and the author concludes that the treatment beneficial in typhoid fever is also the most useful in cases of infection due to the paratyphoid bacilli.

J. H. T. W.

MACADAM (William). **Thrombosis of the Cerebral Arteries in Paratyphoid B.**—*Jl. Roy. Army Med. Corps.* 1916. Oct. Vol. 27. No. 4. pp. 499–500.

The chief features of this striking case are briefly as follows :—

Australian soldier, aged 25, admitted into Netley hospital, from Gallipoli, September 26th, 1915, in the "typhoid state," semi-conscious; Cerebral symptoms of six days' duration; temperature, while on the hospital ship, ranged between 102° F. and 104° F. Complete right-sided hemiplegia and right facial paralysis; incontinence of urine and faeces. Died two days after admission.

Necropsy. Dura mater adherent and vessels congested. At the base of the brain thrombosis at the upper end of the left internal carotid artery extending into the middle meningeal and its lenticulo-optic and lenticulo-striate branches. An area of softening, of reddish-white colour, the size of a pigeon's egg, involved the internal capsule and lenticular nucleus. On the right side there was thrombosis only in the cortical branches of the middle meningeal. Spleen four times its normal size, with large swellings at the poles due to haemorrhagic infarcts showing purulent softening. Small intestines congested. Ulceration slight and confined to Peyer's patches of the lowest three feet of the ileum. Large intestine normal except for hyperaemia of caecum. "The nature of the infection was confirmed bacteriologically at the autopsy by the isolation in pure culture from the spleen of a Gram-negative bacillus with all the cultural and agglutinating characters of *Bacillus paratyphosus* B."

J. H. T. W.

COURMONT (Paul) & CHATTOT. **Succession chez un même sujet des septicémies paratyphoïdes B et A et des séro-réactions agglutinantes spécifiques.**—*C. R. Soc. Biol.* 1916. June 17. Vol. 79. No. 12. pp. 567–569.

Accepting the proposition that, although such cases are rare, any one person may be successively infected by *B. typhosus*, *B. paratyphosus* A and *B. paratyphosus* B, the authors record a case of a man, vaccinated against the typhoid bacillus, who suffered from an attack of paratyphoid B fever followed, during convalescence, by infection, and fever, due to *B. paratyphosus* A :—

"G.—25 years of age, vaccinated during February 1915 against Eberth's bacillus (four inoculations).

"1*st infection.*—Duration of the fever from the 13th August to the 15th September, 1915 (32 days). Course of fever fairly mild, with maximum temperature 39·6° C. Recovered. Blood culture positive on the 17th day (1st September) :—*B. paratyphosus* B.

"*2nd infection.*—Duration of the fever from the 19th to the 28th October (10 days). Course of fever acute, short; maximum 40° C. during two days. Blood culture, positive on the 6th day (25th October):—*B. paratyphosus* A."

The bacilli were identified by cultures and by agglutination with specific sera.

Agglutinating Reaction with the blood of the Patient:—

	Eberth.	Para A.	Para B.
1st infection (Para B) 17th day 1st Sept. ..	+100	0	+500
2nd „ (Para A) 6th day, 25th Oct. ..	+ 50	0	+100
„ „ 8th day of normal temperature (5th November) ..	0	+400	0

If we accept the above results as correct and free from technical error they are worthy of thought and of further research. The work done upon "agglutinins" is by no means finished. The authors admit that the reactions observed are atypical and they refer to a "paper" by Major SACQUÉPÉE of the French "A.M.C." [*Bulletins et Memoires de la Société Médicale des Hôpitaux de Paris,* 1916, No. 11–12, p. 443] in which other paradoxical reactions are recorded. Facts by all means! But we want also explanations We want to know why an old fact acquaintance turns up, not "four-square" as we knew it but with a small fifth side added. It is variation in form with modification in function. But why? A guess may be correct but it is not safe as a foundation for practice. J. H. T. W.

OLMER (D.) & VOISIN (Roger). **La pression arterielle au cours des fièvres typhoïdes éberthiennes et paratyphiques de l'épidemie de guerre 1915.**—*Bull. et Mém. Soc. Méd. des Hôpit. de Paris.* 1916. July 27. 3 ser. Vol. 32. No. 25–26. pp. 1265–1282. With 10 charts.

These investigations of the arterial pressure in enteric fevers have led to the following practical conclusions:—

"1. The diminution in arterial pressure, but especially the minimum pressure in typhoid fevers, is constant in so much that it may have a certain diagnostic value."

"2. During the 'typhoid state' a marked decrease of pressure, especially of the maximum, foretells some complication and causes a suspicion of heart-muscle failure."

"3. On the other hand a sudden rise of the maximum foretells the appearance of intestinal haemorrhage. When defervescence has begun it may announce a relapse."

"4. It would be of importance, during an attack of typhoid fever, not to be content with the pulse count only, when that appears to fluctuate, but to search for prognostic and therapeutic indications using arterial tension as a guide."

"5. There exist, in fact, outside myocardic syndromes forms of hypotension evolving slowly and out of sight, without rise of temperature, without apparent complications, without modification of the number or the regularity of the pulse beats."

"These forms should be sought for with the greatest care, for it is these, as we believe, that lead in serious cases to sudden death ; *they are brief and sudden forms of suprarenal insufficiency.*"

"6. The recognition of a marked arterial hypo-tension necessitates treatment with the suprarenal hormone (capsules or injections of adrenalin). Subcutaneous injections of adrenalin are the most efficacious."

J. H. T. W.

WHITTINGTON (T. H.). **A Report on the Use of Stock Vaccine in Infection by the *Bacillus typhosus*, with Analysis of Two Hundred and Thirty Cases.**—*Jl. Roy. Army Med. Corps.* 1916. Oct. Vol. 27. No. 4. pp. 422–444. With 12 charts.

This Report by Lt. T. H. Whittington, R.A.M.C., is important when compared with records in which a favourable view is taken of the effects of stock vaccines in the treatment of infection by the *Bacillus typhosus* [cf. MACARTHUR, *Bulletin* Vol. 6, p. 18 ; PAULICEK, LOEWY and others, Vol. 7, No. 1]. As will be seen from the following "Summary" Lt. Whittington was inclined to consider these "vaccines" of some value :—

"In the total vaccinated cases there were twenty-nine in which it appeared that vaccine had a definite good influence. Of these, twenty belonged to Classes 3 and 4, i.e., to those classes in which the prognosis is good. In other words 'good results' are more often obtained where good results can be expected by ordinary methods of treatment alone. On the other hand, the mortality rate and the average length of fever in these classes was slightly worse among the cases who had vaccine.

"Among the cases belonging to Classes 1 and 2, in which the vaccine appeared to do good, none had severe lung involvement. Those cases which had much bronchitis or broncho-pneumonia (the average severe case) ran the severe course which is usual, and vaccine appeared to be of no avail. To say that, if the average severity of the cases treated had been less, the vaccine would have had better results, is merely to say, I think, that the cases would then have done better anyhow. From all this it would appear : (*a*) That it is just those cases in which the physician so much requires help that vaccine is so disappointing ; (*b*) that vaccine neither shortens the fever nor reduces the number of complications in even that class of case which is likely to do well ; (*c*) that there is a decided suspicion that vaccine increases the incidence of haemorrhage.

"The conclusion, therefore, is that the use of stock vaccine in typhoid fever cannot be recommended as a routine treatment. I should add that these conclusions are largely contrary to the impressions which I received during the treatment of the earlier cases. I had not then seen a sufficient number of similar cases which did well without vaccine, and being rather biased in its favour I gave undeserved credit to this treatment."

Two hundred and thirty cases of *B. typhosus* infection were divided into 115 test cases and 115 controls. In each group 15 patients had previously received protective inoculation. The cases were arranged in Classes according to severity.

Class 1.—32 cases very severe and very toxic.
Class 2.—86 cases, severe and toxic.
Class 3.—56 cases of moderate severity.
Class 4.—44 cases, moderately severe, but quite non-toxic.
Class 5.—12 mild cases.

In 205 cases *B. typhosus* was isolated. "The remaining 25 cases . . . were identified by the fact that their serum agglutinated the *B. typhosus* before vaccine was given, and as all were uninoculated this seems sufficient."

The original paper contains full details of the cases, mortality, etc.

J. H. T. W.

Petzetakis. **Vaccinothérapie antityphoïdique intraveineuse.**—*C. R. Soc. Biol.* 1916. July 22. Vol. 79. No. 14. pp. 655–656. With 2 charts.

The author used, with success, a "heated vaccine" containing 100,000,000 bacilli per cc. and injected doses of 0·25 to 0·5 cc. as occasion required. If he had referred even to such literature as is noticed in this *Bulletin* he would have found that the treatment of enteric fevers by means of intravenous injection of vaccines has previously been recorded:—this *Bulletin,* Vol. 6, No. 1 (Ichikawa); and Vcl. 7, No. 1 (Reibmayr). J. H. T. W.

Yagisawa (M.). **La vaccination antityphoïdique dans l'armée japonaise.**—*Paris Méd.* 1916. May 27. Vol. 6. No. 22. pp. 490–492.

In September 1908 antityphoid vaccine was applied for the first time to check an epidemic in the Japanese Army. Since that time the number of individuals protected by inoculation has increased yearly. Inoculation is not compulsory; nevertheless, since December 1910 almost all the recruits have been vaccinated. Soldiers with long service have, as a rule, been re-vaccinated yearly. The vaccine used is prepared by the method of Pfeiffer-Kolle, with slight modification.

Since 1910 two doses of protective vaccine have been given to each man: (1) 1 to 2 mgm. microbes; (2) 2 to 3 mgm. microbes. Occasionally a third dose has been given: 3 to 4 mgm.

Between 1897 and 1903, that is between the period of the Sino-Japanese war and the Russo-Japanese war, there was no sensible increase in the cases of enteric fevers. The average annual sick-rate was 629; the death-rate 121; or 5 per 1,000 and 1 per 1,000.

After the Russo-Japanese war there was a sudden rise in the number of enteric cases, especially during 1907. "We then had 1,375 cases with 218 deaths. The sick-rate was 8 per 1,000; the death-rate 1·3 per 1,000." After protective vaccination was introduced the sick-rate sank to 0·7 per 1,000 and the death-rate to 0·08 per 1,000.

The sick-rate and mortality rate from 1908 to 1912 among the inoculated, as compared with the uninoculated, are well shown in the following table:—

Dates.	Effectives (Daily average).		Number of				Per thousand.			
			Cases.		Deaths.		Cases.		Deaths.	
	Vaccinated.	Unvaccinated.	Vac.	Unvac.	Vac.	Unvac.	Vac.	Unvac.	Vac.	Unvac.
1908	4,450	188,881	—	1,109	—	180	—	5·9	—	1·0
1909	11,448	189,897	10	760	—	121	0·9	4·0	—	0·6
1910	113,874	89,369	136	519	19	71	1·2	5·8	0·2	0·8
1911	203,028	22,740	118	71	26	11	0·6	3·1	0·1	0·5
1912	203,570	15,646	148	74	18	18	0·7	4·7	0·1	1·2
Total	563,370	506,533	412	2,533	63	401	0·7	5·0	0·1	0·8

Note.—Soldiers vaccinated once only are considered as unprotected. Soldiers not carefully examined after inoculation are not included in the above statistics.

The author concludes from careful examination of typhoid and paratyphoid fever cases that:—

(1) "Our experience shows that antityphoid vaccination acts favourably not only on the sick-rate but also on the gravity of the malady."

(2) "The protective power of the inoculation lasts for about one year and protection is greater when inoculation is frequently repeated." [cf. SCHWARZ, *Bulletin* Vol. 3, p. 98, and FILDES, see above.]

In a foot-note the author states that soldiers of the Japanese army are now protected against paratyphoid fevers by means of a polyvalent vaccine.

J. H. T. W.

MAGNAN (A.). **La vaccination contre les fièvres paratyphoïdes A et B.** —*C. R. Acad. Sci.* 1916. Mar. 27. Vol. 162. No. 13. pp. 484–486.

14,451 men received, with an interval of eight days, two injections of a vaccine containing the two paratyphoid bacilli. The first injection 1·5cc.; the second 2 cc. The usual precautions were ordered. Certain of the men disregarded them and suffered accordingly! M. Magnan's final paragraph is as follows:—

> "Thanks to the initiative of the Medical Inspector, Principal Medical Officer of Health to an army, I have practised antiparatyphoid vaccinations in four regiments of that army. As to three of those regiments, the reactions were insignificant, none severe. In one regiment, reactions were more marked, but this is explained by the large number of men in the incubation stage of paratyphoid B fever, which prevailed in epidemic form, who received their injection at a time when they were already infected by the bacillus."

[This is an interesting record, showing as in other instances that a "vaccine" will not check an infection already installed. It may, indeed, precipitate the oncoming attack.]

J. H. T. W.

GRIXONI (Giovanni). **Febbre tifoide e vaccinazione antitifica.—Conferenza tenuta all' Associazione Sanitaria Milanese il 18 marzo 1915.** [Typhoid Fever and Antityphoid Vaccination.]—*Attualità Med.* 1916. May. Vol. 4. No. 5. pp. 301–335. With 13 text figs.

Major Grixoni, professor of military sanitation, has compiled a most useful paper giving the results of his enquiries into the value of antityphoid vaccine for prophylactic purposes and for the treatment of typhoid fever. The chief points with which the paper deals are as follows:—1. Typhoid fever in Italy, with charts showing mortality as compared with "Malaria" and Cholera. The death-rate among the civil population and in the army is compared. 2. The principles of anti-typhoid vaccination, the kinds of vaccine in use and the doses usually given. 3. The prophylactic value of the vaccination. Tables comparing death-rate among vaccinated and unvaccinated are given showing, on charts, figures for the British Army in India, the "U.S.A." army and portions of the Italian army. 4. The theory and practice of the vaccination. 5. The antityphoid vaccination in war. 6. The therapeutic value of the vaccine. All the professor's researches point to the inestimable value of anti-typhoid and anti paratyphoid vaccines.

J. H. T. W.

HOWELL (Katharine). **Observations on the Production of Antibodies after Antityphoid Inoculation.**—*Jl. Infect. Dis.* 1916. July. Vol. 19. No. 1. pp. 63–68.

These " Observations " might serve as a model for a certain type of worker, so intent on his own inventions that he cannot find space in which to give credit to others. The author reviews the literature of the subjects with which she deals, gives to the labourer his reward, and supplies full bibliographical references.

The following extracts from Miss Howell's " Observations " give the main findings :—

" Two healthy men . . . received three subcutaneous inoculations of U.S. Army typhoid prophylactic vaccine at 8 and 10-day intervals. The first dose was 0·5 cc. (500 millions), the 2nd and 3rd doses were 1 cc. (1,000 millions) each. No. 1 had a moderately severe local reaction, and slight constitutional symptoms . . . for 24 hours after the 1st and 2nd inoculations. About three hours after the third injection a very severe general reaction came on and lasted for from 24 to 48 hours. No. 2 had moderately severe local reactions after each injection, but practically no constitutional symptoms. Blood was collected aseptically from each patient at 2- or 3-day intervals for five weeks, then at longer intervals. The sera were withdrawn and inactivated by heating at 56° C. for 30 minutes."

Agglutinin.

" The microscopic method was used with inactive sera and a killed suspension of a highly agglutinable typhoid strain in normal salt solution. The tubes were incubated at 37° C. for 2 hours, then kept in an ice-box overnight and readings made in the morning."

No. 1 :—No typhoid agglutinins before inoculation ; three days after the first injection 1 : 40, 19 days 1 : 640 ; 60 days 1 : 2,560, the highest point.

Normal serum from No. 2 agglutinated typhoid bacilli diluted to 1 : 10. Five days after the first injection the titre was 1 : 40 ; 19 days 1 : 160 ; 63 days 1 : 5,000 ; on the 134th day the titre had fallen to 1 : 80.

In each case there was a slight fall after each injection.

Opsonins.

" Estimation was made by diluting the serum to the point of opsonic extinction. The dilution in which 50 leucocytes had the same percentage of cells taking part in phagocytosis as a normal control with salt solution, was considered the point of extinction. Varying dilutions of inactive sera, human leucocytes, and killed typhoid bacteria were incubated in capillary tubes at 37° C. for 15 minutes. A film was made from each tube, stained, and the number of leucocytes taking part in phagocytosis observed."

No. 1 :—almost immediate rise ; 3rd day titre 1 : 30 ; 1 : 20 on the 5th and 1 : 240 on the 10th ; slight negative phase after 2nd and 3rd inoculations. From the 33rd to the last observation on the 60th day the titre remained 1 : 240.

No. 2 :—Almost immediate rise ; height of curve, reached on 21st day, was 1 : 480 ; remained 1 : 240 from 26th to 113th day ; then fell to 1 : 120 on the 134th day.

Bacteriolysin.

" 0·0125 cc. fresh guinea-pig serum, while having in itself little or no bactericidal effect, was sufficient to re-activate a normal inactive serum. One tenth cubic centimeter of a 1 : 12 dilution of normal re-activated serum, plated after a 3-hour incubation at 37° C. with 0·02 cc. of a typhoid suspension, gave approximately sterile plates. The typhoid suspension was of such titre that 0·1 cc. of 0·02 cc. typhoid suspension in 0·6 cc. of broth plated at once gave from 500 to 600 colonies per plate. . . . Varying dilutions of each [human] serum were placed in tubes and a fixed amount of fresh guinea-pig serum (0·0125 cc.) and of typhoid suspension (0·02 cc.)

added to each tube. For each dilution a control tube containing a corresponding amount of inactive serum and of typhoid suspension was set up. Two other controls were also used: one of typhoid bacilli, fresh guinea-pig serum, and broth; the other of typhoid bacilli and broth only. From each of these tubes 0·1 cc. was plated on agar at once, in order to determine whether or not the colony counts from all the tubes showed the anticipated similarity. The tubes were then incubated three hours at 37° C. and again 0·1 cc. from each was plated. Counts of colonies were made after a 24-hour incubation. The highest dilution of active serum that showed a markedly lower count than the corresponding serum control, was considered to show the amount of bacteriolysin produced. The plates made at once had from 500 to 600 colonies per plate. After a 3-hour incubation the control plates . . . contained 1,000 or more colonies. The plates from the reactivated serum varied from sterility to 1,000 or more colonies per plate.

"In both Nos. 1 and 2 the titre of the sera before the antityphoid inoculation was 1 : 48."

"The highest titre reached in No. 1 was 1 : 384, 30 days after the first injection of vaccine"; the same on the 60th day.

"No. 2—1 : 384 on the 26th day; 1 : 96 on the 113th day and 1 : 48 [normal] on the 134th day."

Complement Fixation.

Technique that of the Wassermann test (one tenth method) "Complement-fixation was obtained in No. 1 on the 14th day and was most marked on the 25th day. In No. 2 fixation was obtained on the 17th day and was most marked from the 29th to the 63rd day after which the power of fixation decreased, and was wholly lost on the 124th day."

J. H. T. W.

British Medical Journal. 1916. July 29. pp. 154–155.—"**The Enterica Group.**"

Under the above "heading" we find recorded the proceedings of a meeting of the "Anzac Medical Society," at Cairo.

The chief paper, already noticed in the August issue of the *Bulletin*, was contributed by Lt.-Col. Walter Summons. The discussion, which followed the reading of that report, dealt with the enteric fevers and not with questions concerning nomenclature. It contains nothing new. [To add the term "Enterica group," to a sufficiently unsatisfactory nomenclature does not simplify the work of classification. Why not, when writing, or speaking of the members of the enteric group of bacilli, adopt the generic name, *Enterica typhosa* and the other specific names already suggested for the paratyphoid bacilli? They are simple and scientific, and link the enteric fevers to their causative organisms.]

J. H. T. W.

Castellani (Aldo). **Enteric and Typhoid: a Point in Nomenclature.** [Correspondence.]—*Lancet*. 1916. Nov. 25. p. 920,

In this letter Dr. Castellani points out that the term "Enteric" as an inclusive title for the typhoid and paratyphoid infections was used in the 2nd edition of the "Manual of Tropical Medicine," the joint work of Dr. Chalmers and the writer. [The term is now generally used and marks an advance along the path of scientific classification.]

J. H. T. W.

SANARELLI (G.). **Sullo sviluppo autogeno delle infezioni tifiche e paratifiche.** [The Autogenous Development of Typhoid and Paratyphoid Infection.]—*Ann. d'Igiene.* 1916. July 31. Vol. 26. No. 7. pp. 459–474.

The first part of this essay is retrospective reviewing the history of enteric fevers from 1811 to the present day. Prof. Sanarelli next states the proposition on which his theory is founded:—Typhoid and other enteric fevers are not primary intestinal infections spreading from that focus to the system generally; they are, on the contrary, infections of the blood and lymph with a secondary destructive effect on the cells and epithelium of the gut. The enteric infections alone are not the whole cause of the illness which follows. Their toxins are supposed to act upon the *B. coli* causing it to become an additional infecting agent; and the theory of ROUX and RODET (Sur les relations du *B. coli communis* avec le B. d'Eberth et avec la fièvre typhoïde—*Soc. de Biologie,* 21 fevr. 1890) is quoted:—"The possibility that the coli- bacillus may be a saphrophytic form of the typhoid bacillus."

The author next discusses the action of "gases (sewer gas)" "chemical agents" and "cold and damp" on bacilli found generally in the intestinal flora of man and animals showing that they may become virulent under certain conditions. White rats were submitted to currents of "putrid gas." They died in two to ten days with marked enteritis, no other bacteria being present except the usual intestinal flora, which more or less resembles that of man.

As a further example METCHNIKOFFS' work on *B. proteus* is mentioned. It has been quoted as the cause of infantile and other diarrhoea but it is a "ubiquitous germ found constantly in man and in the intestines of domestic animals." It cannot therefore, unless roused to virulence by some agent, be the cause of these diarrhoeas. The author finds that the paratyphoid bacilli exist in the atmosphere, in food, in water and in the intestines of men apparently in good health. He further states that while antityphoid vaccination reduces the number of cases of Enteric fever due to *B. typhosus* it may even favour the appearance of diseases due to the paratyphoid bacilli. Finally Professor Sanarelli writes:—"Abundant food of good quality and the suppression of excesses and unnecessary fatigue especially in time of war represent the principal benefits of prophylaxis against infectious diseases, but, most particularly, against the autogenous development of intestinal infection of a typhoid type."

J. H. T. W.

SLEEPING SICKNESS.

CHALMERS (Albert J.) & O'FARRELL (W. R.). **Measurements of Dutton and Todd's Gambia Strain of *Trypanosoma gambiense* Dutton 1902.** —*Jl. Trop. Med. & Hyg.* 1916. Aug. 15. Vol. 19. No. 16. pp. 189–194. With 1 plate and 5 charts.

This paper is the second of a series dealing with trypanosomes studied in the Khartoum laboratories. The first note [see this *Bulletin*, Vol. 4, p. 500] related to the type of trypanosome obtained from cases of sleeping sickness occuring in the Lado Enclave of the Anglo-Egyptian Sudan. In this the authors concluded that the organism was identical with that found in cases of sleeping sickness in Uganda and the Congo, but they were unwilling to consider it to be the same species as that described by DUTTON in 1902, because there was not sufficient information available as to the specific characters of that strain.

In the present note observations on the original Gambia strain of DUTTON & TODD are recorded. The material consisted of the original slides made by DUTTON from the first case (Mr. K.) of human trypanosomiasis discovered by him in the Gambia, and also blood films made from a rat inoculated from the second European case (Mr. Q.) of human trypanosomiasis observed by DUTTON & TODD. These slides were sent to the authors by Professor TODD.

Unfortunately, the number of trypanosomes present on the slides of DUTTON'S original case was much too small to allow of the measurement of 1,000 non-dividing individuals, but a photograph of one of the long forms is given. The slides from the rat contained, however, numerous parasites and the authors measured 1,000 non-dividing individuals. The result is set forth in tables and a chart. The minimum length was 15 microns and the maximum 36·5. The breadth varied from 1·5 to 3 microns. The average length of 1,000 individuals was 26·1 microns. The general appearance of the trypanosome is illustrated by micro-photographs: long, intermediate and short forms are shown. No approach to posterior nuclear forms was seen.

The measurements of DUTTON & TODD'S strain were compared with those given by :—

1. DUTTON for the original strain,
2. BRUCE for the Uganda strain,
3. STEPHENS & FANTHAM for the Congo strain,
4. The author for the Lado strain.

The conclusions are :—

> " In the conclusions which we drew at the end of our previous paper we wrote as follows :—
>
> " 'There being no data, that we know of, to compare these strains with *T. gambiense* Dutton 1902 we are of the opinion that, at all events provisionally, it would be safer to keep the name *Trypanosoma castellanii* Kruse 1903 for these strains until more light is thrown upon the complicated problem of: What is *Trypanosoma gambiense* Dutton 1902 ? '
>
> "We now consider that the measurements given above afford sufficient evidence to conclude that the causal agent of sleeping sickness in Uganda, the Congo, the Lado of the Anglo-Egyptian Sudan, Principe, and the Gambia belongs to one and the same species, viz, *T. gambiense* Dutton 1902."

W. Yorke.

BASSETT-SMITH (P. W.) & MANGHAM (S.). **Forms of Fever in the West African Expeditionary Force.**—*Jl. Roy. Naval Med. Serv.* 1916. Oct. Vol. 2. No. 4. pp. 454–463. With 3 charts, 1 plate & 1 fig.

Malaria was one of the main causes of fever amongst the naval ratings and marines landed with the West African Expeditionary Force in the Cameroons; the infection was generally of the malignant tertian type, but in some cases quartan parasites were found. Other cases of fever were more difficult to explain. Malarial parasites were not found and quinine had no influence on the pyrexia.

Certain of the pyrexial cases, with or without malarial infection, were peculiar in having a very marked eosinophilia for which no cause could be found. One of these was found to be infected with trypanosomiasis; practically the whole of the present paper is a record of observations made upon this case.

The patient was ashore for ten months, first on the Niang River and later on the Campo. He was frequently bitten by tsetse flies. Trypanosomes were found in the blood on the 17th December, 1915. He had one injection of salvarsan. On the voyage home quinine was given.

On admittance to the Seaman's Hospital in March, 1916, the patient was debilitated, anaemic, depressed mentally, had lost much weight and suffered from irregular attacks of fever. There was no adenitis, no hyperaesthesia, no tremors and no rash. Other details are given. A high eosinophilia was constantly present, whilst trypanosomes were found from time to time. The course of the disease and the treatment administered are described in full. From March 4 to April 10 atoxyl was given in doses of five grains intramuscularly every third day and also four subcutaneous injections of oxide of antimony (MARTINDALE). This course of treatment controlled neither the fever nor the trypanosomes in the peripheral blood. On April 10 there was a great outburst of trypanosomes and antimony was given intravenously. This was followed by increasing doses of antimony subcutaneously and atoxyl on alternate weeks. The result was still very unsatisfactory; the gradual rise in the successive trypanosome outbursts was very marked up to June 4. The organism appeared to be entirely atoxyl resistant, though the patient was gradually improving in condition. From June 5 until the time of writing intravenous treatment only was used, at first galyl ·35 gr. every week, and later alternately with intravenous injections of antimony oxide (MARTINDALE'S) in doses of 1½ drm. or ·15 gr.

The authors state that the alternate use of intravenous injections of galyl and antimony caused a steady and marked improvement in temperature, trypanosome count and the patient's condition and further that a successful result is not impossible if the treatment can be continued.

Attention is drawn to the cylical outbursts of trypanosomes in the peripheral blood, which occurred about every fifth day.

Numerous differential leucocyte counts were made and the proportion of polymorphonuclear and eosinophil leucocytes together with the variation of temperature and number of trypanosomes in the peripheral blood are given in charts. The curve representing the

polymorphonuclears showed frequent and large excursions corresponding, as a rule, with the trypanosome curve. The eosinophils were relatively very numerous during the first three months; there was always a marked fall about the time of a rise in the trypanosome curve; the lowest eosinophil count was at the time of the highest trypanosome count. No autoagglutination of the patient's red cells was noted. An account of the morphology of the trypanosome is given; it differs in no respect from *T. gambiense*. The difficulty in obtaining animal infections and the mild symptoms are suggestive of *T. nigeriense*.

In conclusion the authors write that they recommend that all cases with a marked eosinophilia for which no cause can be determined coming from the Cameroon region be looked upon as possible cases of trypanosomiasis.*

The condition of the patient is still excellent. W. Y.

KOPKE (Ayres). **Estudo da doença do sôno. Memoria premiada no concurso de 1915 e apresentada sob a divisa:** *Therapia Sterilisans Magna*. [A Study of Sleeping Sickness. A Prize Essay presented at the Competition of 1915, in the Section: *Therapia Sterilisans Magna*.]—Sociedade de Geografia de Lisboa. 114 pp. 1916. Lisboa: Tip. da Cooperativa Militar.

An essay, embracing the result of the author's study of sleeping sickness as observed in Portuguese West Africa, from 1904 to the present time. Notes in full are furnished of no less than 132 cases, treated in various ways, but with only a modicum of success. The author's general conclusions are as follows:—

1. The maximum dose of atoxyl attainable with man is 15 cc. of a 10 per cent solution, corresponding to 1·5 grammes of the drug. It may be given in hypodermic injections without local inflammation or pain. There is an advantage in repeating the injection every 8 or 10 days.

2. This treatment will clear the peripheral blood of trypanosomes to such an extent that inoculation experiments on animals will be negative. The trypanosomes will, however, persist in the cerebrospinal fluid, a fact which shows that such treatment is not capable of bringing about a cure, when once the meninges have been invaded. A cure may, however, be hoped for in those cases in which the examination of the cerebro-spinal fluid proves negative.

3. The injection of atoxyl into the cerebro-spinal canal can be done without danger, whatever may be the degree of benefit which will result.

4. It is at any rate an advantage, from the prophylactic point of view, to clear the peripheral blood of a patient from trypanosomes so that he is no longer a focus of infection.

5. None of the substances tried by the author in subarachnoid injections, such as lysol, brilliant green, atoxyl, arsacetin, neo-salvarsan and galyl, will sterilize the cerebro-spinal fluid sufficiently to cure sleeping sickness. J. B. N.

*** In a letter to the Editor dated 25 October, 1916, BASSETT-SMITH writes that infection has been established in two guineapigs. The parasites are scanty and the author states that he considers thick dehaemoglobinised films stained with Eosin azure the best method of examination.**

Duke (H. Lyndhurst). Trypanosomiasis in Northern Uganda.—*Jl. of Hyg.* 1916. Sept. Vol. 15. No. 3. pp. 372–387. With a map.

The author refers in considerable detail to the report by Miss Robertson on cattle trypanosomiasis in the Masindi District of Northern Uganda [see this *Bulletin,* Vol. 3, p. 419].

He doubts the correctness of the opinion expressed by Miss Robertson that the trypanosomes responsible for the disease in cattle, and a free-flagellated *brucei* like organism found in a dog, had been imported from outside owing to the moving of large herds of cattle from the south, and had only recently established themselves in the *morsitans* belt near Masindi. His criticisms are based partly upon an exhaustive enquiry amongst the natives and partly upon his own experiments and observations.

Duke writes that, as a general principle, the idea of a large area of very sparsely populated bush country, thick with game and *morsitans,* being free from trypanosomes is to his mind untenable. [This opinion was expressed by the reviewer when summarising Miss Robertson's paper. *loc. cit.*] The view is expressed that the pathogenic trypanosomes of cattle and domestic animals were originally derived from the apparently harmless parasites of wild game.

Miss Robertson's assumption that disease or death in cattle in the area visited is invariably due to trypanosomes is inadmissible, as in reality several other diseases are known to have occurred among these herds; eg., Nsotoka appears originally to have referred to pleuropneumonia and is now used for rinderpest or acute trypanosomiasis; and even Amakebbe. the best known native name for a disease of cattle, is of doubtful significance and Duke has known it applied to rinderpest and undoubted cases of trypanosomiasis. Hutchins, the C.V.O. of Uganda, expressed the opinion that some of the accounts of the epidemic, as supplied by various herdsmen, point to Babesia as the causative agent.

Duke points out that Miss Robertson is inclined to assume that once an animal is infected with trypanosomes, it is doomed to a more or less speedy death. Infections with *T. nanum, T. vivax* and *T. uniforme* are not necessarily fatal, or at any rate not rapidly fatal, but often extremely chronic. Hence, the conclusion that an animal has been recently infected because the only sign of disease is the occurrence of *T. vivax* or *T. nanum* in the blood is not justifiable.

Hutchins confirms Duke's opinion that when the herdsmen refer to *Lwakipumpuru,* they mean genuine trypanosomiasis. It is interesting to note that there have been at least two epidemics of Lwakipumpuru in the Buruli cattle country before the one under discussion—one about 1860 and the other about 1890. Details are furnished of the movement of cattle in the Buruli country where, as a rule, *morsitans* is scanty; the grazing grounds of Buruli are separated from the great tsetse reservoir of Masindi by a belt of short grass plains some 8 to 10 miles broad. But given some particularly favourable year or season in which *morsitans* for some reason or other multiplied and spread, then we have all the requirements for an epidemic in Buruli. It is highly probable that such favourable seasons do occur. In face of such epidemics cattle would be driven northwards across the Kafu and the probability of their encroaching on the great Masindi fly belt would be increased. Again, with an increased number of cattle on the narrow strip of plain between the river and the fly country, there would be an increased likelihood of " following fly " accompanying traffic along the roads through the fly belt, meeting herds.

The part played by " following fly " in the spread of disease is a very important one, as demonstrated by an experiment by FISKE and the author. In this it was shown that although a slow pedestrian will soon shake off " following fly " the pace of a cyclist seems to exert an irresistible attraction, a large number following for miles. Such agencies doubtless play their part in the spread of trypanosomiasis and Duke holds it possible that the introduction of bicycles among the natives of Busindi, dating from 1908, had a definite influence on the recent epidemic. Various fly experiments in the Masindi *morsitans* belt are recorded.

Wild *G. morsitans* were fed on suitable animals, more especially monkeys. In all 13 experiments, comprising 1857 flies, were performed. A trypanosome which, for convenience, the author refers to as *T. brucei* was obtained on 11 occasions. These observations were made approximately one year after Miss ROBERTSON's visit. *T. pecorum*, *T. nanum*, *T. vivax* and *T. uniforme* were recovered on numerous occasions, double and treble infections in the experimental animals often resulting. During this period two " natural " infections in domestic animals which had been exposed to fly were seen, viz., *T. brucei* in a dog and *T. pecorum* in another dog. The flies used in the above feeding experiments were dissected and examined for trypanosomes. The author notes that infection of proboscis only is ascribable to *T. vivax* or *T. uniforme* ; those of proboscis and gut to *T. nanum* or *T. pecorum* ; those of the gut and salivary glands to the *brucei* like organism ; and those of the gut only, to immature infection with either *T. nanum* and *T. pecorum* or the *brucei* like organism. He compares his result with those obtained by Miss ROBERTSON and concludes that as the " gut not proboscis " infections had not increased *T. brucei* is not of new introduction.

In another series of fly feeding experiments, the results were controlled by dissection of all the flies employed, as they died, either during the experiment or at its conclusion. On every occasion where a positive salivary gland infection was seen, the animal fed upon developed *T. brucei ; T. nanum* appeared more commonly than *T. pecorum.*

Inoculations were made from the blood of 30 game ; 16·6 per cent were shown to be infected with trypanosomes, 6·6 per cent being *T. brucei.* Similar experiments were performed in other tsetse districts of the Northern Province to determine the distribution of the *brucei* like organism.

1. Ngussi River, 3-4 miles from the falls. In this neighbourhood three species of Glossina were obtained, *G. pallidipes*, *G, palpalis,* and *G. fusca.* A number (65, 95 and 5 respectively) of each were dissected and gut and salivary gland infections were found in 3 per cent of *G. pallidipes.* *T. brucei* was also obtained in feeding experiments. No game inoculations were made in this district.

2. Region of the Tonya Peninsula and shore of Lake Albert. Here *G. palpalis* only was found ; 407 flies were dissected, but no salivary gland infections were observed. Of 20 game examined 9 per cent were found infected with *T. nanum*, but none with *T. brucei,* nor was *T. brucei* obtained in feeding experiments.

3. Chopi, Victoria Nile and Bugungu Region. *G. palpalis* and *G. morsitans* were found and *T. brucei* was obtained once in a feeding experiment with *G. morsitans*. Twenty game were examined and 19 per cent. were found to be infected with trypanosomes, but none were of the *brucei* type.

4. Namasale Peninsula. No tsetse were found here, but ten game were examined with negative results.

5. Northern Buruli. Here again no tsetse were found and 17 game were found to be negative.

Duke compared the various strains of "*T. brucei*" which he recovered during his investigations and concludes that they belong to the same species.

The disease in dogs is acute and is characterised by keratitis in the majority of cases. Oedema of the face is often present in sheep and goats. The average duration of the disease in 8 dogs was 26 days, in 5 monkeys 40 days (one young monkey not included in this, was alive and active nearly four months after infection).

The author states that the above facts show that a trypanosome of the *brucei* type is widely distributed throughout the southern part of the Northern Province, probably indeed wherever *G. morsitans* and *G. pallidipes* are found. Speaking generally, wherever cattle are exposed to the bites of tsetse, especially of *morsitans* and *pallidipes*, they sooner or later sicken and die out. The, at first sight, alarming discovery in the Masindi fly belt of a trypanosome showing close affinity to an organism recently isolated from man in South Africa need not cause any undue alarm. A similar or identical trypanosome will probably be found in every *morsitans* or *pallidipes* area in Africa. As it may, for unknown reasons, develop the faculty of more or less permanent survival in man a host usually immune—it must be viewed as a potential source of danger to human beings. A number (228) of natives living in the fly belt were examined with negative results.

From the administrative point of view Duke does not regard the trypanosome as a human parasite and provided steps are taken against the introduction of large numbers of persons into the at present sparsely populated fly area, there is no reason to expect any untoward development.

W. Y.

VAN SACEGHEM (R.). **Contribution à l'étude de la transmission du** *Trypanosoma cazalboui*.—*Bull. Soc. Path. Exot.* 1916. Vol. 9. No. 8. pp. 569-573.

Certain trypanosomes are seen, in nature, to be transmitted exclusively by Glossina, in which they undergo a definite developmental cycle; such are *T. brucei-pecaudi*, *congolense-dimorphon* and *rhodesiense*. Others are transmitted in a simpler fashion in that they do not undergo any definite cycle in the intermediate host but are propagated mechanically. Thus *T. evansi* according to DARUTY DE GRANDPRÉ is spread by *Stomoxys nigra* and LEESE obtained further results in the transmission of this parasite by Tabanus, Haematopota and Stomoxys.

A third group of trypanosomes are propagated indifferently by Glossina and other biting insects. Such is *T. cazalboui*, the development of which in Glossina is quite different from that of the first group.

Instead of an " infection totale " of the digestive tract there is merely a direct infection limited to the proboscis. The development of *T. cazalboui* in the proboscis of Glossina is a step on the way to mechanical transmission.

BOUFFARD at Bamako has established clearly the possibility of actual transmission of *T. cazalboui* by Stomoxys.

The author states that at Zambi he has proved definitely that *T. cazalboui* var. *pigritia* is spread by flies other than Glossina. A description of this parasite is given. [It does not appear to differ in any way from *T. cazalboui* except perhaps in the fact that it did not exhibit rapid translatory movements.] In the district of Zambi (Bas Congo) are herds of cattle which find pasturage in places where it is certain that Glossina does not occur, yet infections of *T. cazalboui* are found in these herds. New cases are observed only during the rainy season—November to May.

Van Saceghem observed that the first cases of infection coincided with the appearance of a Haematopota—*H. perturbans* EDWARDS. The pasturage of herds which become infected is in the vicinity of papyrus swamps where *H. perturbans* swarms ; this fly does not exist in those places in which the cattle remain healthy.

H. perturbans, captured in animals infected with *T. cazalboui* var. *pigritia*, exhibit active trypanosomes in the gut. It seems that the trypanosome can become fixed to the mouth parts of the fly and remain alive there for a certain time so that they are able to infect a susceptible animal. In those districts where, in 1912, more than forty per cent. of the animals had trypanosomiasis Glossina did not occur but *H. perturbans* was very common.

A few details are given concerning *H. perturbans*, which is a new species to be described shortly.

The reservoir of the virus in the district concerned is the sick cattle ; certain wild animals must also play a part, although all those examined were negative.

The author concludes :—

1. *T. cazalboui* var. *pigritia* is transmitted in nature by flies other than *Glossina.*
2. The principal agent is, in the Zambi district, *H. perturbans*, Edwards. Probably this is not the only transmitter, Stomoxys, Lyperosia, mosquitoes and even certain ticks, in the author's opinion, also playing a part.

W. Y.

VELU (H) & EYRAUD (R.). **Trypanosomiase des chevaux du Maroc. Infestation d'un jeune chien par l'allaitement.**—*Bull. Soc. Path. Exot.* 1916. Oct. Vol. 9. No. 8. pp. 567–568.

It has been shown by NATTAN-LARRIER that *Schizotrypanum cruzi* passes regularly into the milk of infected females whereas *T. equiperdum* is but rarely found in the mammary secretion; furthermore LANFRANCHI has demonstrated that animals infected with *T. brucei* or *T. gambiense* can infect their young by suckling.

Whilst working with the trypanosome of horses from Morocco the authors noted a similar fact, a dog infected with this virus transmitting the parasite to one of its litter.

Details of the observation are given. W. Y.

Marcandier (André) **La résistance globulaire dans quelques cas de paludisme, de fièvre bilieuse hémoglobinurique et de maladie du sommeil.**—*Bull. Soc. Path. Exot.* 1916. Oct. Vol. 9. No. 8. pp. 647–665.

The first portion of this paper, in which the technique employed and the red cell resistance in cases of malaria and blackwater fever are described, is not dealt with here. The second portion deals with the resistance of the red blood cells of cases of trypanosomiasis to sodium chloride solutions of decreasing concentrations.

The author found that in 14 cases in the second stage of sleeping sickness the resistance of the washed red corpuscles to hypotonic salt solutions was increased in one case, very slightly diminished in two cases and normal in eleven instances. He concludes therefore that the sleeping sickness even when the trypanosomes are in the peripheral blood does not appear to exert any definite influence on the red cell resistance.

W. Y.

Novaes (Eucario). **La trypanosomiase brésilienne et son rapport avec le corps thyroide. Travail fait à l'Institut pathologique de l'Université de Genève.**—*Rev. Méd. de la Suisse Romande.* 1916. Sept. 20. Vol. 36. No. 7. pp. 592–614. With 2 plates.

The author writes that he has studied this disease because, firstly, it is an interesting infection due to a special parasite, the importance of which is demonstrated more clearly each year, and secondly, because there occurs in it a pathological modification of the thyroid gland of such a kind that he has sought to establish a parallel between endemic goitre and the Brazilian disease, both of which occur in mountainous countries.

A summary of the literature—more especially of the Portuguese—is given together with personal observations made upon the organs of infected monkeys, mice and dogs.

The earlier portion of the paper concerns itself with the development and morphology of *Schizotrypanum cruzi* in *Conorhinus megistus*; this is followed by an account of the development of the parasite in the vertebrate host. Novaes agrees with Brumpt, Rocha and Mayer that the trypanosome in the blood stream is always free in the plasma and that an intracorpuscular stage in the red cells does not occur. Polymorphism of the parasite in the blood, indicating different stages ending in the adult form, was observed. The youngest forms have an elongated blepharoplast situated at the posterior extremity, the nucleus is narrow and the whole parasite is elongated and narrow. Intermediate stages between this and the fully formed adult trypanosomes were also seen. In support of the view that these elongated, narrow parasites are really young forms, which reach the blood after multiplication in the tissues, is the fact that they predominate during the first days of infection and are subsequently replaced by the broader forms with the characteristic blepharoplast representing the adult trypanosomes. Some of the young forms do not show any differentiation of the undulating membrane and flagellum. That very rarely Leishmania forms are found in the circulation is explained by the fact that certain tissues, especially the cardiac muscle, which is

more fragile than others on account of the absence of a sarcolemma, are liable to disintegrate prematurely and allow the escape of the still undeveloped parasites into the tissue spaces and consequently into the circulation.

The author made a careful study of the morbid anatomy of the disease. He examined the skeletal muscle, unstriated muscle, cardiac muscle, adipose tissue, subcutaneous cellular tissue, central nervous system, lymphatic system, bone marrow, thyroid gland,suprarenals, lungs, liver and spleen of animals infected with the trypanosome. From this study he concludes that most of the cells of the organism tolerate invasion by the parasites fairly well, without undergoing any appreciable modification. The degenerative phenomena and frequently even the functional disturbances which are observed do not appear to be in direct relationship to the presence of colonies of the parasite. If, however, modification of the tissues does occur it must be attributed to mechanical and chemical causes. Atrophy of histological elements due to compression exercised by large colonies of the parasite has been observed and also a proliferation of the tissues due to their action. Wholesale degeneration of parasites produces a destruction of their cellular hosts which on its dissolution promotes inflammatory changes in the vicinity.

Endotoxins set free on the death and absorption of the trypanosomes account for the fact that certain cells enclosing only a small number of the parasites are altered, whilst others containing large numbers present a normal appearance. It is to the setting free of toxins and their dissemination by the lymphatic circulation that the more or less extensive inflammatory lesions, which are not in the immediate region of parasite colonies, are probably due. There is, nevertheless, an evident relationship between the number of foci of parasites destroyed and these inflammatory phenomena.

Certain organs, such as the thyroid gland, which do not harbour the parasites exhibit morbid changes. One must not, therefore, regard the presence of parasites and the pathological modifications as equivalent, nor explain clinical phenomena solely on the assumption of the presence of the trypanosomes.

The author draws attention to a certain morphological modification of the Leishmania stages of the parasite which depend upon the kind of tissue invaded. Thus, the longitudinal striations of skeletal muscle render the parasites narrower and smaller, whilst in a diffuse tissue, such as fat, they are larger and rounder because their development is more freely effected.

The paper closes with some remarks on the clinical symptoms of the disease.

Three coloured plates illustrate the author's points. W. Y.

Kofoid (Charles Atwood) & McCulloch (Irene). **On *Trypanosoma triatomae*, a New Flagellate from a Hemipteran Bug from the Nests of the Wood Rat *Neotoma fuscipes*.**—*Univ. California Publicat. Zool.* 1916. Feb. 18. Vol. 16. No. 10. pp. 113–126. With 2 plates.

Prospectors in the desert regions of California and Arizona have reported from time to time that they have been attacked at night by biting insects, whose bite produced local inflammation and general

malaise, but had no permanent ill effects. Some of the insects sent to the authors were found to be *Triatoma protracta.* These hemiptera are found in the nests of the wood rat, *Neotoma fuscipes.*

Dissection of some of the insects proved that they contained a flagellate, whose life-cycle, so far as it is known, has a resemblance to that of *Trypanosoma lewisi* in the rat flea, as described by MINCHIN and THOMSON. The authors use the same terminology as the last mentioned workers, except that they replace the term "kinetonucleus" by that of parabasal body. The full outline of the life-history could not be obtained, but the stages found resembled those of *T. lewisi.*

The trypanosome phase was found in a single bug that had recently fed. Its stomach contained half digested blood swarming with trypanosomes. The body of the flagellate was 20μ to 39μ in length and 0·6μ to 1·6μ in diameter. There is a short flagellum, which is "less than 0·2μ of the body in length." The flagellum passes along the membrane and reaches the parabasal body, with which it appears to merge in most cases. A parabasal rhizoplast may be present. The parabasal body varies in size and shape. This is considered to support the view of KOFOID that the "kinetonucleus" is in reality the parabasal body or kinetic reservoir, fluctuating in the volume of its substance with the changing internal conditions and motor activities." Intracellular stages of the trypanosome have, so far, not been seen. Some stomach phases, however, have been interpreted as merozoites or stomach phases resulting from multiple fission. They are shorter and more rigid in body than the trypanosome forms. The parabasal body is at the extreme posterior tip of the body.

Large crithidial forms occur in the stomach of the bug. Forms transitional between them and trypanosomes have been found. The parabasal body is anterior to the nucleus, the nucleus is rounded and vesicular, as opposed to the elongate, slender, asymmetrical form in the trypanosome. The parabasal also is barlike and is transversely situated. The authors justly remark that their conclusion as to the identity of the crithidial flagellate with the trypanosome "rests merely on similarities to the cycle of *Trypanosoma lewisi*, and not as yet upon experimented feeding and infection. While this hypothesis of identity is a reasonable one and proof of it by experiment is to be expected, the *possibility* remains of the occurrence here of two specifically distinct organisms." The crithidial forms are from 8μ to 40μ long, with a diameter of 1·8μ to 2·5μ, rarely as much as 4μ. The body is less sinuous than the trypanosome and the movements more darting in character. The nucleus is spherical with a chromatin-encrusted membrane. The flagellum terminates in a small granule immediately above the level of the bilobed transversely located parabasal. Two types occur. One is large, suggestive of intracellular multiple fission in the epithelial cells, but it has never been found in the intracellular condition. The second form shows a series of forms of decreasing size and increasing stoutness. Some slender flagellates have also been observed.

Small trypaniform flagellates have been found in great abundance in the rectum of the bug, where they were in active movement. They were somewhat smaller than the merozoites in the stomach.

A comparison is made of this parasite with the stages of *Schizotrypanum cruzi* in *Conorhinus megistus*. The trypanosome and crithidial stages are much alike, but there is more divergence in the rectal trypaniform stages. No forms of the trypanosome have been found in the body cavity or in the salivary glands of *Triatoma protractus*. It is stated that "a re-examination of Schizotrypanum is desirable, especially since the distinctions between this genus and Trypanosoma are less obvious now than formerly."

A. P.

i. WATERSTON (James). **Notes on African Chalcidoidea—V.**—*Bull. Entom. Res.* 1916. Oct. Vol. 7. Pt. 2. pp. 123–132. With 5 text figs.

ii. TURNER (R. E.) & WATERSTON (James). **A New Parasite bred from** ***Glossina morsitans*** **in Nyasaland.**—*Ibid.* pp. 133–135. With 2 text figs.

i. The male of *Eupelminus tarsatus* Waterst. is here described for the first time and the female more fully. LAMBORN considered it to be a hyper-parasite of *G. morsitans* [see this *Bulletin*, Vol. 8, p. 266], but the author "cannot agree that the parasitic status of *E. tarsatus* is definitely fixed by our present knowledge of its habits."

ii. The new parasite was bred from a pupa obtained at Monkey Bay. It is described with figures, belongs to the family *Bethylidae*, and is named *Prolaelius glossinae*, sp. nov.

A. G. B.

RELAPSING FEVER AND OTHER SPIROCHAETOSES.

HAGLER (Frederic). **Relapsing Fever.**--*Milit. Surgeon.* 1916. July. Vol. 39. No. 1. pp. 36–43. With 2 plates.

The author, who was attached to the American Red Cross Hospital Unit, Belgrade, Serbia, draws attention to the lack of publicity afforded the epidemic of relapsing fever in Serbia, much attention having been devoted to the epidemic of typhus concurrent with it. He points out the confusion of typhus fever, typhoid and relapsing fever under the term typhus, and uses the term relapsing fever to differentiate the spirochaetosis he describes.

A brief account of the morphology of *Spirochaeta recurrentis* is given, the author noting that the morphology of the parasite in one patient may be different from that presented by the next patient. . [Doubtless the differences are explicable by reference to the processes of growth and division.] The mild cases presented fewer, shorter, thinner and more fragile spirochaetes than the more severe cases.

For staining purposes, Giemsa staining was considered too slow and the following method was devised :—

> "Collargol, 1 gram, in distilled water, 2 grams, is allowed to stand for at least twenty-four hours, although a slightly longer period is preferable. The resultant solution is filtered several (three to four) times through ordinary heavy filter paper. The stain is then ready for use and in glass-stoppered containers keeps indefinitely. When used, a large loopful is placed on a clean slide, a small loopful of blood freshly drawn with usual precautions is stirred into the drop of collargol solution on the slide, and a film made by drawing rapidly out with a second slide."

A drop of blood about one-third the size of the drop of collargol is recommended. The blood cells appear as unstained or mottled discs, while the spirochaetes stand out as uncoloured spiral figures on the mahogany background. The method is simple, rapid and permanent. If malarial parasites are present, however, they are not stained.

With regard to transmission, the louse was inculpated. "Relapsing fever appeared with typhus fever (which is admittedly transmitted by the louse), and measures instituted against lice soon markedly decreased the incidence of both. *This difference is noted, however, that whereas typhus practically disappeared with lice, relapsing fever persisted and continued to develop in the medical wards of our Belgrade hospital until systematic sulphuric fumigation of wards and rooms was undertaken to destroy bed-bugs.* After this it also disappeared. Thus, it would seem that the bed-bug certainly is one and probably the most important of the agencies of transmission."

The incubation period was probably not more than ten days, and was seldom more than seven or eight. An account of the symptoms is given. They continued unrelieved "until about the eighth or ninth day, when a peculiar break was noted in the train." A decided drop in temperature occurred—" a pseudo-crisis—of two or more degrees, succeeded by a rise to a higher point than any before attained and accompanied by a distinct aggravation of all the symptoms." It was followed in a few hours by a genuine crisis. A fall of temperature, as much as 8 degrees in two hours, marked the end of the paroxysm. As many as five relapses occurred. The afebrile periods were of the same duration in one patient, but in different persons varied from

7 to 10 days. The prognosis was good. "Quinine alone seemed to have no effect on the disease, but when with full doses of Fowler's solution, a fairly constant effect was noted. "The former in 10 gr. doses, three times daily, and the latter in 7 m., and increasing doses, shortened noticeably the length of the febrile periods and reduced the number of relapses." Salvarsan was not available.

The illustrations show the appearance of a blood film stained by the collargol method, and the temperature chart of patient given symptomatic treatment, and another under treatment with quinine and Fowler's solution.

A. Porter.

i. Babes (V.). **Hémorragies méningées et autres manifestations hémorragiques dans la fièvre récurrente.**—*C. R. Soc. Biol.* 1916. Oct 21. Vol. 79. No. 16. pp. 855–857.

ii. Gane (T.) & Buïa (I.). **Sur les phénomenes méningitiques pendant la fièvre récurrente chez les enfants.**—*Ibid.* pp. 864–865.

i. The first paper gives an account of certain features of the epidemic of relatively benign relapsing fever that was observed by the author during the outbreak in Bucarest in 1915. The greater number of the patients responded rapidly to an injection of salvarsan. The epidemic was spread among the poorer classes, it is stated, by louse bites, but other means of infection occurred. Deaths were rare. One fatal case, however, showed an eruption of tiny haemorrhagic spots on the thorax and limbs. At autopsy, tumefaction of the spleen, atrophic cirrhosis of the liver and abundant haemorrhage of unknown origin into the stomach and intestines were found. The gall bladder and spleen contained a bacillus of the Coli group, which caused small necroses in the spleen.

Haemorrhages were frequently seen during the epidemic. In about half the cases, there was an eruption of hyperaemic spots on the abdomen and limbs, often disappearing after the paroxysm. The localisation of the malady in the meninges is more important. Meningeal symptoms, manifested in opisthotomos, cephalalgia and Kernig's sign were seen, more especially in children.

A full account of the autopsy on a 50 year old man is given. He had suffered from relapsing fever for several days with headache and stiff neck. In hospital improvement occurred, but a relapse ensued on the next day. His blood contained numerous spirochaetes. He died in coma on the third-day in hospital. At autopsy, the pupils were contracted, and the skin yellowish with little purple spots on the limbs. The meninges were thick, and made oedematous by a brownish yellow to deep red liquid. Confluent ecchymoses occurred around the meningeal vessels, especially the capillaries, so that the meninges were converted into a thick red tissue. The cerebral mass was anaemic, and the ventricles contained red fluid, but no spirochaetes were found in it. The pharynx, larynx and left lung were hyperaemic and the right lung oedematous and adherent. The heart was hypertrophied and fat. The spleen was greatly hypertrophied and the pancreas enlarged. The liver was tumified and fatty. Microscopically, spirochaetes were found in the blood of most of the organs. The small vessels of the meninges contained large numbers of them. The skin lesions were less pronounced than in typhus.

It is considered that the meningeal form of relapsing fever is established. The type of fever and the presence of spirochaetes differentiate it from typhus, while the presence of a rash in relapsing fever must be remembered to avoid confusion with the more fatal disease.

ii. The second paper deals with the authors' experience of four cases of relapsing fever showing a clear meningeal syndrome without leucocytic reaction in the cerebro-spinal fluid. Two cases were in brothers aged 6 and 10, one was a man of 30, and the fourth a boy of 12. The clinical history of the last case is given. The clinical appearance was that of typical meningitis. Numerous spirochaetes, however, occurred in the blood. The meningeal condition lasted four days, the temperature oscillating about 39° C. On the 5th day it fell sharply and the meningeal syndrome disappeared. After seven days, a second attack occurred and lasted five days, with meningeal symptoms. The cerebro-spinal fluid showed nothing abnormal on examination. After this attack, the child recovered completely. The other cases presented much the same features.

The authors do not think that their cases are like those described by BABES, but consider that they should rather be placed in the pseudomeningitis [*meningisme*] group.

A. P.

ROBERT (A. Eug.) & SAUTON (B.). **Action du bismuth sur la spirillose des poules.**—*Ann. Inst. Pasteur.* 1916. June. Vol. 30. No. 6. pp. 261–271.

The authors made use of bismuthotartrate of sodium, prepared according to COWLEY'S method. All the solutions used contained exactly 1 per 100 parts of bismuth. A healthy fowl can tolerate 30 to 35 mgm. of bismuth per kilogram of weight; one infected with spirochaetosis only 15 to 20 mgm. per kilo. The action of the drug on the spirochaetes in vitro was poor, but it was efficacious on infected birds. The drug was given 24 to 30 hours after infection, when the spirochaetes had appeared in the blood, 0·2 cc. or 0·5 cc. being the dose.

The intravenous injection of 20, 25, or 30 mgm. of bismuth per kilo. of bird 48 hours before inoculation with infected blood retarded the appearance of the spirochaetes by a day. Intra-muscular injection of 50 to 70 mgm. as a preventive was quite efficacious, no spirochaetes appearing. If the injection were made four hours after infection, it retards and attenuates the malady. For curative purposes, early treatment is best. Two successive intravenous inoculations of 10 mgm. per kilo. weight of host given 30 and 48 hours after the appearance of the spirochaetes gave the best results.

A. P.

URBAIN (Gaston). **Méningo-encéphalo-myélite des poules (? spirillose).**—*Bull. Soc. Path. Exot.* 1916. Oct. Vol 9. No. 8. pp. 561–563.

The author, working in the state of Parana, Brazil, has observed a condition in fowls that he terms meningo-encephalo-myelitis. Adult fowls only were affected. The disease was not contagious. It lasted from 15 to 30 days. The infected bird was sleepy, remained in one place and refused food. On the 3rd or 4th day conjunctivitis appeared and then keratitis of one eye. The bird was irritable if forced to move, and turned in circles, lesions of the nervous centres or of the labyrinth being thus indicated. Later the second eye became blind. Symptoms of meningitis appeared; the neck muscles contracted more and more, the wings and feet became paralysed, and epileptiform attacks occurred a day or two before death.

The blood of an infected bird coagulated with difficulty. There were slight signs of enteritis. The cloaca was dilated and paralysed. The liver, spleen, kidneys and apex of the heart showed signs of degeneration. Inflammation of the meninges, haemorrhages in the olfactory lobes, cerebral hemispheres, optic lobes, hypophysis, optic nerves, medulla and spinal cord occurred. The labyrinth was normal. The blood showed a marked eosinophilia. The secretions of the conjunctiva, anterior chamber of the eye and of the throat, the intestinal contents and nerve substance showed a micro-organism resembling a spirillum, which stained blue with Giemsa and showed two or three red granules, the whole resembling what is seen in diphtheria. Pure cultures of the organism were found in the eye and brain. Animal experiments so far have been negative and, owing to lack of media, it was impossible to make cultures.

[As meningeal symptoms have been observed in relapsing fever, this work is summarised, though there is no proof that the malady was due to a spirochaete.] A. P.

BENIANS (T. H. C.). **Relief Staining for Bacteria and Spirochaetes.** —*Brit. Med. Jl.* 1916. Nov. 25. p. 722.

The paper refers chiefly to the relief staining of bacteria. The microörganisms themselves are not stained, but they are left colourless in a coloured and less transparent background.

> "A small drop of a 2 per cent. aqueous solution of Congo red is placed on a slide, and a very small quantity of the bacterial culture, or of the exudate to be examined, is rubbed into it with the platinum wire; the drop is then spread out into a tolerably thick film either with the wire or by means of another glass slide. The film, an opaque blood red, is allowed to dry; the slide is then washed over with a 1 per cent. solution of H Cl in absolute alcohol and dried in the air, or with blotting paper, although the latter is apt to tear the film. The film is then ready for examination with the oil immersion lens."

Broth and salt emulsions need centrifuging before use. In blood so treated, osmotic changes in the red cells may occur. "Spirochaetes as a rule show up fairly sharply, though they have not the brilliancy that the dark background condenser gives them, and of course one has not here the opportunity of observing them in motion." It should be remembered that an organism seen through an opaque film usually seems larger than it appears in a stained preparation. A. P.

SANGIORGI (Giuseppe). **Sugli spironemi della bocca.** [Spirochaetes of the Mouth.]—*Pathologica.* 1916. Sept. 15. Vol. 8. No. 188. pp. 283–285. With 8 text-figs.

The author first gives a general account of the spirochaetes of the mouth, including a sketch of the results of PROWAZEK and HARTMANN and MUHLENS. The latter workers differentiated three types of mouth spirochaetes, large, small and intermediate.

The present author divides the mouth spirochaetes into two groups, the first being forms with refractile bodies and large curves, the second those with less refringent bodies and small curves. Each group is subdivided into three, small, intermediate and large forms. The first group has large elements 9·6μ to 16μ by 0·8μ, with six to eight curves; intermediate forms 6·4μ to 8μ by 0·8μ, with three to four curves; small forms 3·2μ to 4μ by 0·8μ with two or three curves. The second group contains large elements, 8μ to 10μ by 0·4μ to 0·5μ, with four to six curves; intermediate forms 4·8μ to 8μ by 0·4μ to 0·5μ, with three to four curves; and small forms measuring 2·4μ to 3·2μ by 0·4μ to 0·5μ, with one or two curves.

A very brief discussion as to the possible homologies of the above forms with those described by the earlier workers on *S. buccalis* and *S. dentium*, and with the Treponemata described by NOGUCHI is given, the results being not very clear.

[The whole suggested classification is very artificial. It has been shown for some time that the number of coils of a spirochaete is an indication of its rate of motion and is not a specific character. It would seem that the author has not regarded sufficiently the great morphological variation of the spirochaetes.]

A. P.

SPIROCHAETOSIS ICTEROHAEMORRHAGICA.

GWYN (N. B.) & OWER (J. J.). **Infective Jaundice (Spirochaetosis Ictero-haemorrhagica). A Preliminary Report.**—*Lancet*. 1916. Sept. 16. pp. 518–519. With 4 text-figs.

The authors, who are members of the Canadian Army Medical Corps, give a preliminary report on certain features of Weil's disease, as observed by them. The clinical course is outlined. There may be an abrupt onset with chill, or a more gradual one with headache, dizziness, nausea, persistent vomiting, diarrhoea and abdominal pains. A few hours later, fever with thirst and aching of the muscles occurs. Jaundice is noticed in 48 to 72 hours. Haemorrhages into the conjunctivae and skin may occur. Bleeding from the nose, mouth, stomach and bowels has been known. There is a decided albuminuria, with numerous casts and red blood corpuscles. In severe cases the prostration is practically a collapse. After three to four days, in mild cases, the fever gradually drops, the vomiting and abdominal and muscular pains subside, while the jaundice fades. Slight or severe febrile relapses are seen or a mild fever may continue for 12 to 20 days. The pulse is slow in relation to temperature and symptoms.

"Jaundice of greater or less degree, with injection of the conjunctivae, herpes, dry tongue, sordes, and late appearing papular rashes in a severely prostrated patient make the general picture of the disease."

A leucocytosis with 80 per cent. polymorphonuclears is present. The faeces are usually bloodstained, and show occult blood reaction at times, but contain no parasites.

In one case only were spirochaetes obtained from cultures of the blood or the blood itself of a patient. Spirochaete-like organisms were then found in the sediment of serum from a blood clot. Drawings of the structures observed are given. Similar bodies were seen in a deep agar anaerobic culture of blood on the fifth day. Animal inoculations so far have all failed, but the cases only came under observation late in the disease. The authors are aware that their results do not fulfil all the "requirements necessary to prove a causal organism in an infectious disease," but publish in the hope of encouraging others.

A. P.

STOKES (Adrian) & RYLE (John A.) **A Note on Weil's Disease (Spirochaetosis icterohaemorrhagica) as it has occurred in the Army in Flanders.**—*Brit. Med. Jl.* 1916. Sept. 23. pp. 413–417. With 13 charts & 3 text-figs.

The paper opens with an account of the work of Dr. IKADA and his colleagues on the malady known as Weil's disease [see this *Bulletin*, Vol. 8, p. 51]. They also give an outline of the results of the Japanese workers on the etiology and probable mode of spread of the malady, their own experience leading them to favour infection by way of the skin.

Fifteen cases of Weil's disease were observed in Flanders, and three deaths occurred. The earliest cases were seen on the fifth and sixth days. The latest admitted was on the tenth day of illness. With one exception, all the men had been recently, or were at the time, employed in the trenches. All knew when they were first affected, a tribute to the acuteness of the onset of the malady. One only knew when the characteristic jaundice appeared, and he dated it on the fourth day.

The symptoms are described in detail. As they are much like those described by GWYN and OWER [see above], they need not be repeated. The sets of observations corroborate one another. The prognosis varies. Mild and severe forms of the disease were seen. In some cases the malady was of short duration; in others, the men were very ill and three of them died. Ten cases are described in detail. Guinea-pigs were inoculated with blood from ten patients and two of them showed spirochaetes later. A table showing the day of the disease on which the blood was taken, the quantity inoculated, and the result is given. Two of the four experiments done on the sixth day of illness were positive and no positive results were obtained after the tenth day. The infected guinea-pigs became ill on the 5th and 6th days. Their temperature rose to over 104° F. in each case. The post-mortem results of both men and animals corresponded with those obtained by the Japanese workers.

The spirochaetes found in the liver smears of the guinea-pigs varied in length, longer forms being the more common. Under dark-ground illumination they "seemed to be composed of closely packed refractible particles." Three sketches, not drawn to scale, but representing the shapes and forms of the spirochaetes observed are given. So far, no spirochaetes have been seen in the urine of the patients. Experiments on infecting guinea-pigs with urine are not yet complete. Cultures were not made.

From their results the authors believe that epidemic jaundice (spirochaetosis icterohaemorrhagica) in Japan and in Flanders is identical.

A. P.

MARTIN (Louis) & PETTIT (Auguste). **Présentation de préparations microscopiques et de pièces anatomopathologiques, relatives à la spirochétose icterohémorragique.**—*C. R. Soc. Biol.* 1916. July 22. Vol. 79. No. 14. p. 657.

The authors, having received from Dr. STOKES two guinea-pigs inoculated with the virus of infectious jaundice, which he had isolated from European soldiers on the French Front, showed specimens of the spirochaete found therein. The spirochaete was very polymorphic, and presented the characters of *Spirochaeta icterohaemorrhagiae* as described by the Japanese discoverers, whose work is quoted by the authors. They also recall that for field purposes, animals should be inoculated with several cc. of blood or urine taken during the first seven days of illness. In positive cases, the experimental animal usually dies in about fourteen days, and presents obvious jaundice and extensive haemorrhages.

A. P.

i. GARNIER (Marcel). **La transmission au cobaye de l'ictère infectieux primitif.**—*C. R. Soc. Biol.* 1916. Nov. 4. Vol. 79. No. 17. p.p. 928-930.

ii. MARTIN (Louis) & PETTIT (Auguste). **Réaction hématophagique dans les ganglions lymphatiques du cobaye, au cours de la spirochétose ictéro-hémorrhagique.** - *Ibid.* pp. 946-947.

iii. RENAUX (Ernest). **Note sur la Spirochétose ictéro-hémorrhagique.** - *Ibid.* pp. 947-949.

i. The author inoculated 28 guinea-pigs with urine or blood of patients suffering from infectious jaundice, 16 with blood and 12 with urine. Two of the experiments had to be discarded. Of the remaining 26, four of the inoculated guinea-pigs died, the transmission having been effected in three with blood and in one with urine. Of the animals which succumbed two were inoculated with blood taken from the patient on the day of the appearance of the jaundice. One of three animals inoculated with blood taken on the second day of icterus died. The positive result obtained by inoculating urine was with that taken from the patient on the 13th day of jaundice. Jaundice appeared in the inoculated animals from the 9th to the 12th day after injection. The spirochaete was found in smears from the liver and kidneys.

ii. This paper records the presence of hyperplasia of the lymphatics of a guinea-pig infected with ictero-haemorrhagic spirochaetosis. Small haemorrhagic layers surround the ganglia, and the lymphoid tissue shows a more or less reddish tint. The subcortical and interfollicular sinuses are engorged. An undue proportion of leucocytes showing amphophile granulations is present. The characteristic of the ganglionic reaction in this form of spirochaetosis is the haematophagic phenomenon.

iii. The author gives a general account of the various appearances met with in cases of icterohaemorrhagic spirochaetosis observed on the Western Front in a Belgian hospital. The liver and the kidneys appear to be most affected. Albuminuria and urobilinuria are found during the 8th and 9th weeks.

In some cases the hepatic symptoms predominate, in others the renal ones are the more obvious. Renal symptoms are considered to have a bad significance in prognosis, the only two deaths observed by the author having been in renal cases.

For the detection of the spirochaetes, the urine was submitted to centrifuging for 30 minutes at 4,000 revolutions. On the tenth day of illness the spirochaetes were found in small numbers, the greatest number being obtained on the 15th day. Very small numbers have been found in patients' urine even after seven weeks. *Spirochaeta icterohaemorrhagiae* could not be identified in faeces, owing to the presence of intestinal spirochaetes. Anaemia was often noted in the cases. Extensive haemorrhages were unusual. In the first week of illness there was a leucocytosis, and from the 3rd to 4th week a leucocpenia was observed.

A. P.

MISCELLANEOUS.

VIALATTE (Ch.). **Rapport sur le fonctionnement du laboratoire de microscopie de Beni-Abbès (Sahara-Oranais) en 1915. (Paludisme, Fièvre récurrente, Trypanosomiase, Microfilariose, Myiase, etc.)**—*Bull. Soc. Path. Exot.* 1916. July. Vol. 9. No. 7. pp. 469–486. With a map.

The laboratory at Beni-Abbès came into existence in 1914 [see this *Bulletin*, Vol. 6, pp. 341–2]. It is pointed out that the laboratory has only a modest outfit, and that research work has been done on medical tours or at the daily clinics.

1. Epidemiology of Malaria in the Wady Saoura and especially at Beni-Abbès—The Wady Saoura is formed at Igli by the junction of two other wadys at about 30° N. and 2° W.; it runs south-east for about 250 kilos and then is lost. Water does not flow in it except in the rainy season, but pools, generally salt, are found in it at all times. Its bed is occupied by shrubby vegetation. The climate is that of the desert: the air is dry, rain is rare, and the variations of temperature within 24 hours are great. The inhabitants, about 7,000, are Arabs, negroes from the Sudan, negroids and berbers; they are miserably poor. Water is scarce and is raised by means of primitive wells; most are constantly in use , but others, which have become disused, serve as mosquito breeding grounds till they become choked with sand. The permanent pools above mentioned serve the mosquitoes. It is noted that the winter, spring, and summer of 1915 were very dry and the collections of water were reduced to a minimum.

Of 41 children examined at Igli (May, pre-epidemic period) three had large spleens; none showed parasites. Of 100 sick children in several villages, visited in November, 28 showed parasites: 18 *P. falciparum*, 3 and 7 *P. malariae* and *vivax*. Crescents were often numerous in the former. Half moon bodies and "corps en pessaire" were frequently found. For prevention quinine is distributed freely and is appreciated. Details are given with regard to the administrative and military centre, Beni-Abbès. Here benign tertian is the most common of the forms of malaria.

Relapsing Fever—Five cases were diagnosed in the year, or 14 in twenty months. Three came from Igli where there was a small epidemic. It is not known how the other cases were contracted. In each case there was a single relapse. A sign always noted was the drunken gait (*démarche ébrieuse*) of the patient.

Debab—There was little trypanosome infection in 1915, due to the dryness of the season. Tabanids were few. Of 31 camels examined only one was infected when in 1914 the rate was 17.9 per cent.; 34 horses were free.

The remaining sections deal with filarial embryos found in the blood of eight horses, myiasis in camels, haemogregarines of reptiles, acarian parasites of a fly, and papular eruptions caused in summer by the bites of a species of Phlebotomus [see this *Bulletin*, Vol. 1, p. 239].

A. G. B.

PARKER (E. G.). **Sanitation of American Samoa.**—*U.S. Nav. Med. Bull.* 1916. July. Vol. 10. No. 3. pp. 563–567.

The rat problem in American Samoa is difficult because these rodents are innumerable, their habits are arboreal and there is abundant native food for them. The Government now offers 2½ cents apiece and in Mauna 19,834 rats were caught, by native methods, in December, 1915. Their destruction is important in view of the recent famine. The protection of owls has also been urged. Throughout the world the standard of one rat to one person is generally accepted; this estimate is quite inadequate in Samoa; 30 rats to one human being is regarded as more accurate. There was an epidemic of whooping cough in 1915, imported from Upolu. It was thought that the attacks were less severe and of shorter duration than in the U.S.A. Several deaths occurred amongst infants.

An account is given of the havoc wrought by the hurricane of January, 1915, and the measures taken to avert famine and pestilence. [For an account of the diseases of American Samoa see this *Bulletin*, Vol. 6, p. 352.]

A. G. B.

ROSENAU (Milton J.). **The Prevention of Tropical Diseases.**—*New Orleans Med. & Surg. Jl.* 1916. July. Vol. 69. No. 1. pp. 33–42.

In this interesting address, read at the 13th annual meeting of the American Society of Tropical Medicine, the author of necessity begins by discussing what diseases are to be regarded as tropical. As diseases not regarded as tropical he instances tuberculosis, pneumonia and typhoid which "ply unusual havoc in warm countries." Of the former he writes:—

> "Tuberculosis is exceedingly prevalent in tropical countries, due, no doubt, to close contact between children and adults under unhygienic surroundings, aided by the enervating influence of heat and the sapping of resistance by faulty diet. When I was in Santiago de Cuba, I made a study of the vital statistics of that unhappy city, and discovered that for a period of years before the Spanish-American War there were many more deaths among the native population from tuberculosis than from yellow fever, although Santiago had been an endemic focus of yellow fever for many years. Despite this situation, much attention was given to yellow fever and none at all to tuberculosis."

Pneumonia may prevail with great intensity in the tropics, as in the Canal Zone, and on the Rand. "The inhabitants of Vera Cruz dread going to the City of Mexico for fear of contracting pneumonia." Up to the time of the Spanish-American war, typhoid was believed to be absent from the American tropics; it is now known to be very prevalent.

The address leads up to the point that the prevention of tropical diseases rests primarily upon scientific research.

A. G. B.

BLANCHARD (R.). **Quelques cas de pseudo-parasitisme et de xéno-parasitisme.**—*Bull. Soc. Path. Exot.* 1916. July. Vol. 9. No. 7. pp. 522–541. With 2 figs.

According to Professor Blanchard, a pseudo-parasite is harmful and aggressive by itself; it may be only a simple saprophyte or a simple saprozoite (by which he means animals living in the body at the expense of decomposing matters), but it may also become pathogenic. A xeno-parasite is inert and not pathogenic unless it acts secondarily, by traumatism, by intoxication or by the microbes which accompany it. But he admits that these definitions are not wholly satisfactory.

He proceeds to discuss in a very interesting manner cases of slugs and myriapods in the alimentary canal, anguillulae in the urine, and cases of pseudo-Strongylus and pseudo-hydatid-cyst in the lungs, some of which he himself has met with and others from the literature. For the details the paper must be consulted.

Blanchard explains the cases in which living slugs have been passed by the anus or have been vomited (SHIPLEY, Gordon HEWITT) by the fact that when these creatures are irritated they secrete a large quantity of mucus which serves them as a protection; in one instance the slug is supposed to have been eaten with lettuce a fortnight before.

He refers to a case of LAVERAN and ROUBAUD in which a myriapod was discharged from the nasal fossa, and mentions two cases which he previously reported and two recent ones. In each of these a living *Geophilus carpophagus* was passed per rectum.

A puzzling case of vinegar eels in the urine was only explained when it was found that the eels bred in a small cup into which the tip of a pipette fitted when it was put in its box, but an authentic case of these creatures living in the bladder has been recorded [STILES and FRANKLAND].

Blanchard was the means of correcting the diagnosis in the case of a man with leucin in the urine, the spherules of which had been taken for the eggs of a giant Strongylus; the patient was thus spared nephrectomy. He failed however to secure a revision in a case of DIEULAFOY's, diagnosed as a hydatic cyst of the lung cured by the patient's coughing it up. The physicians had detected hooks in the membrane, but the parasitologist showed that it consisted of vegetable matter with hairs and a section of it corresponded exactly with that of a piece of peach skin (both are figured). The skin had clung to the man's tonsils and caused an obstinate cough, which ceased when he brought the skin up. This case was published as one of hydatid cyst of the lung in DIEULAFOY's "Manuel de Pathologie interne" (1895).

A. G. B.

LOVELACE (Carl). **Food in Health and Disease: Some Recent Advances in our Knowledge.**—*Texas State Jl. Med.* 1916. Aug. Vol. 12. No. 4. pp. 180–182.

A forcibly written paper which one would like to see reproduced in an English medical journal. The author regards the question of the aetiology of beriberi as closed three years ago by FRASER and STANTON. Attention is drawn to the frequent mis-statement of the nature and cause of the disease which "has been proved over and over again to bear no more relation to rice than it bears to wheat, or barley, or corn, or the sugars, or to foods of all kinds which have been denatured by sterilisation at a high temperature . . . To refer to it as a disease associated with a rice diet . . . is to shut one's eyes deliberately to what is perhaps the greatest fundamental advance . . . that medicine has made since the days of Pasteur and Lister." The analogies between beriberi and pellagra are considered, and in reference to the paper summarised in this *Bulletin* Vol. 1. p. 484 and another the author writes :—

> "The writer is guilty of publishing two papers a few years ago, based on a considerable clinical experience, intended to show that beriberi is not a deficiency disease. Because of my inability to explain certain exceptions (some of which, indeed, I am still unable to explain), the great mass of compelling evidence was undervalued."

"Credit is given to Dr. W. E. DEEKS for having in 1912 [see this *Bulletin*, Vol. 2. p. 491] indicated the causation and cure of pellagra, both dietary, which in 1915 were proved operative and effective by GOLDBERGER. The author goes on to apply the new knowledge to lesser degrees of vitamine starvation such as are common in America at the present day and instances the feeding in the Weir Mitchell treatment of neurasthenia, the success of the modern insane asylum "the real dynamics [of which] lie not in their pharmacies but in their kitchens," the necessity of vitamine-rich food to the poor. "Bolted, vitamin-robbed corn meal is, practically, the only kind you can buy in the Texas market" ; the shorts, containing "most of the nerve protecting, life-saving vitamins," are sold for stock feed. The "food cranks," clamouring for whole grain bread, have turned out to be "seers and prophets."

A. G. B.

SWELLENGREBEL (N. H.). **De afdeeling voor tropische hygiëne van het Koloniaal Instituut te Amsterdam.** [The Department of Tropical Hygiene in the Colonial Institute of Amsterdam.]—*Eigen Haard.* 1916. Aug. 26. No. 35. 12 pp. With 5 plates.

An account of the new department for tropical hygiene in the University of Amsterdam. One of the photographs shows the wing in the new buildings of the Colonial Institute, in which the department will be housed. It will be under the direction of Professor J. J. Van LOGHEM, Dr. N. H. SWELLENGREBEL and Dr. W. A. KUENEN. Another interesting photograph shows a group of the staff and workers.

J. B. Nias.

RIVAS (D.). **The Thermogenic Reaction of the Body against Infection and its Bearing upon Immunity.**—*New Orleans Med. & Surg. Jl.* 1916. Aug. Vol. 69. No. 2. pp. 125–135.

The author, who is Assistant Professor of Parasitology and Tropical Medicine, University of Pennsylvania, classes the means of defence of the body against infection as :—

(1) Mechanical—skin and mucous membrane.
(2) Organotropic and Physicochemical—certain organs and tissues are antagonistic to certain infections.
(3) Humoral—leading to the formation of antibodies.
(4) Histogenic—the tissue produced restricting the infection.
(5) Cytogenic—phagocytosis.
(6) Thermogenic.

He goes on to consider (*a*) the normal and (*b*) the morbid thermogenic activity of the body. The first explains our immunity against tuberculosis of birds (creatures of higher temperature) and infections of cold blooded animals.

Under (*b*) he discusses febrile and afebrile diseases. In the group of febrile diseases are included most of the bacterial diseases. Among the afebrile diseases he places—all fungoid diseases, most protozoan diseases except malaria and relapsing fever, and all the metazoan diseases except the acute stage of trichiniasis. Trypanosomiasis is not regarded as a febrile disease ; fever in metazoan diseases is usually due to bacterial infection. Thermogenic activity is considered to be in relation to the toxic nature of the virus ; the more toxic the virus the more fever. Among the bacterial diseases leprosy and cholera are non-toxic and afebrile. However, the reaction depends partly on the dose ; e.g., a guinea-pig will react to a normal dose of anthrax bacilli or a minimal lethal dose of diphtheria toxin, but if the dose is increased a hundred times the animal dies with subnormal temperature.

Febrile infections usually confer immunity ; afebrile do not. The absence of fever in all fungoid and most protozoan and metazoan infections is held to explain the incurable nature of these diseases. The paper ends with a suggestion for the investigation of the use of thermotherapy in tropical medicine.

[An interesting paper with several debateable points. Two minor details are perhaps worth mention. It is stated that " it is not improbable that the bite of more than one infected tsetse fly is required to produce sleeping sickness." *T. gambiense* infection in susceptible animals, both large and small, has repeatedly followed the bite of a single infected fly. This does not however disprove the point the author is making, namely that the body is capable of destroying a certain number of introduced protozoa. Do mosquitoes " bite by preference the white rather than the negro ? "] A. G. B.

Masters (Walter E.). **The Prevention of Conception amongst the Natives of the Kasai Basin, Central Africa.**—*Jl. Trop. Med. & Hyg.* 1916. Apr. 15. Vol. 19. No. 8. pp. 90–91.

The author states that the administration of drugs by the mouth and the mechanical obstruction of the vagina are the usual means of prevention of conception among the natives of the Kasai basin. Amongst certain tribes a child is not desired more than once in three years. The vagina is therefore plugged with rags or dried grass. Three cases are quoted. In one there was constipation and urinary retention of eight days duration. Examination was not allowed and after death " the vagina was found to be very firmly plugged with a cloth which was about half the size of a man's closed hand." In another case with similar symptoms the vagina was found to be plugged hard with finely chopped grass. This was removed and the patient was rapidly recovering when two days later she did not seem so well and a cloth was found to have been wedged in the vagina. She was two months pregnant. The third case was one of criminal abortion produced by a dose of black powder. Owing to these methods and trypanosomiasis the author thinks the region will be depopulated in the course of a few years. "As many as 45 per cent. of the thousands whom I have examined have enlarged cervical glands which mean that they will die off in about three years." [This seems unduly pessimistic unless the enlargement was marked and no cause for it other than trypanosomiasis could be assigned.] A. G. B.

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CANTLIE (James). **Anatomical Data concerned in Operations on the Liver and in Clinical Examinations.**—*Trans. Soc. Trop. Med. & Hyg.* 1916. July. Vol. 9. No. 8. pp. 221–233. With 4 figs. & 1 plate.

This paper deals with, the clinical constants that are of value in determining the size of the liver; the demonstration that there are two livers, a right and a left, which are independent in their vascular and bile duct supply; the danger of wounding the inferior vena cava in searching for pus and how to avoid it; the directions taken by hepatic pus when it passes upward into the chest. The points are usefully illustrated by diagrams and a plate.

A. G. B.

PELLINI (Emil J.) & WALLACE (George B.). **The Pharmacology of Emetin.**—*Amer. Jl. Med. Sci.* 1916. Sept. Vol. 152. No. 3. No. 534. pp. 325–336. With 4 figs.

These authors write from the Department of Pharmacology, University and Bellevue Hospital Medical College. Referring to the widespread use of emetin in pyorrhoea alveolaris they say, " It is not at all improbable in view of the somewhat unusual toxic effect it may induce in animals, that considerable damage has already been done through injudicious dosage or too long-continued administration." They give an account first of other people's researches and then of their own. In these they used the product of the " Hoffman-La Roche Chemical Works, Inc.," who guaranteed its purity. Graphs are reproduced shewing the action on the blood pressure and respiratory movements in dogs, and other effects of the drug.

" Summary. From our experiments we wish to emphasize the following points:—

" 1. Emetin depresses and may eventually paralyze the heart.

" 2. It is a powerful gastro-intestinal irritant whether given by mouth or subcutaneous injection.

" 3. It causes a definite derangement of metabolism, characterized by an increase in nitrogen loss and an acidosis.

" 4. While in normal individuals given moderate doses, these actions may not be of importance, in pathological states of the circulation, intestinal tract, or metabolism, they may be a very definite source of danger."

A. G. B.

ROBB (R. M.). **Heat Fever (Non-Infective Cerebro-spinal Fever).**—*S. African Med. Rec.* 1916. May 27. Vol. 14. No. 10. pp. 154–155.

" About 250 cases " were observed in " East Africa " of a condition described by the author as one " involving the central nervous system, manifesting itself by symptoms of increased pressure of cerebro-spinal fluid, probably due to actual overheating of body tissues and increase of all secretions, of which cerebro-spinal fluid is one." The symptoms are summarised, but no details of cases nor results are given. No blood examinations are recorded. Quinine and brisk depletion are stated to have been of value.

A. G. B.

TEN BRINK (K. B. M.). **Sporotrichose.** [Sporotrichosis.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1916. Vol. 56. No. 2. pp. 178–195. With 9 plates.

An introductory address given by the author at the meeting of the Society for promoting Medical Science in the Dutch Indies on August 19th, 1915. Attention is drawn to the difficulty of diagnosing this condition by clinical features alone. The resemblance in many cases to tuberculous and syphilitic ulceration is extraordinary, and this point is illustrated by a number of good photographs which accompany the paper. To anyone who can make a good Sabouraud's medium the laboratory culture of the fungus is easy, but on the other hand, if the medium is faulty, many disappointments and failures in diagnosis will occur. The harmfulness of treating the condition with mercurials and salvarsan, under the belief that it is syphilis, is duly dwelt upon, as also the impropriety of surgical measures under a wrong diagnosis of tuberculosis. The disease shows no tendency to natural cure, as a rule, but steadily progresses, with the result of producing hideous deformities both on the face and elsewhere. On the other hand, with a liberal dosage of iodide of potassium (4 to 8, or even 12 grammes per diem) the condition can be cured in a few weeks. Relapses, however, may occur if the medication is not kept up for at least a month after the healing of the lesions.

J. B. N.

ESCOMEL (Edmundo). **Sobre un caso de blastomicosis.** [A Case of Blastomycosis.]—*Cronica Med.* Lima. 1916. July. Vol. 33. No. 637. pp. 210–213.

The report of a case of blastomycosis, unfortunately not accompanied by illustrations, in a muleteer, which was treated by the combined local excision of the lesions, by means of the actual cautery, and internal injection of tartar emetic. The action of the latter did not seem so prompt as it is in cases of leishmaniasis. A considerable number of giant cells were noticed in sections of the excised tissue.

J. B. N.

PATTON (C. R.). **Preliminary Note on a Disease called "Bungpagga," found in the Northern Territories of the Gold Coast.**—*Brit. Med. Jl.* 1916. Apr. 1. pp. 483–484.

This curious disease, the author says, has long been known to the natives of West Africa; those of the Gold Coast, Northern Territories, Nigeria, and Senegal are said to recognise it readily. There are native names for it in the Hausa, Dagarti, Walla and Lobi languages. It occurs at the time when the guinea corn and rice are ripe and ready for harvesting, that is, just after the rainy season in the Northern Territories. It attacks all those who are able to eat corn. "It appears to me to be due to a micro-organismal infection which produces a neuro-toxic effect as well as a local reaction." In every one of the pus slides examined the author found a heavy infection of saccharomyces. He is inclined to think that the disease is caused and perpetuated by a yeast fungus. "The yeast spores probably remain in the mud bins in which the grain is stored awaiting a favourable opportunity to grow. . . . The grain becomes infected in the bin, the people eat the grain raw and their intestines are secondary incubators." The incubation period appears to be three days.

Symptoms.—"The onset is sudden; one or more rigors may usher in the attack. The temperature rises rapidly to 103° or so. There is extreme tenderness in the muscles which are to be the seats of inflammation. Within twelve hours painful tumours make their appearance in the affected muscles; only the voluntary muscles are affected, and the abscesses seem always to occur near their insertions. There may be only one nodule, or a crop. In some cases the distribution is bilaterally symmetrical. The tumours are deep-seated; they are hard, non-fluctuating, very painful, with their long axes either in or parallel to the long axes of the muscles affected. They do not correspond to lymphatic glands. Each tumour is about the size of an English hen's egg. They are at first hard and firm, and are easily visible and palpable; later on, if the patient survives, they become slightly soft, but never flabby. Usually, in mild cases, the abscesses point after some weeks, and burst if unopened. As a rule, the fewer the nodules the better the prognosis."

If the patient survives the acute stage he stands a good chance of recovery; the deaths usually occur within the first week.

A. G. B.

BUDZYNSKI (B.) & CHELCHOWSKI (K.). [Abstract and Comments by MacLEOD (J. M. H.).]. **Hunger Swelling in Poland.**—*Jl. Trop. & Hyg.* 1916. June 15. Vol. 19. No. 12. pp. 141–142.

One hundred and ten cases are described of an affection occurring in Poland as a result of the insufficiency and inadequacy of food caused by the German occupation. Nearly half the patients were children under ten; eight died. Their food consisted of potatoes, as much as 5 lbs. per head per day, small quantities of soup, and bread, generally bad, on certain days. The symptoms were "oedema, debility and muscular weakness, intestinal disorders, mental depression, dimness of vision, disappearance of sexual impulses, and alterations in the blood and urine." The oedema might be extreme; in some cases it disappeared in hospital, disclosing extreme wasting. The percentage of haemoglobin was reduced by about half; the lymphocytes and eosinophiles were increased. The condition was attributed to bad potatoes and the lack of other food, especially fats.

A. G. B.

GAITAN U (A.). **Fiebres bilioseépticas.** [Septic Bilious Fevers.]—*Repertorio de Med. y Cirug.* 1916. June. Vol. 7. No. 9. [No. 81.] pp. 387–405.

By bilioseptic fever the author understands a febrile complaint accompanied by enlargement and tenderness of the liver with jaundice, non-infectious and not directly fatal, lasting from 5 to 30 days, and occurring mostly in women. Tenderness in the region of the gall-bladder is the principal physical sign. Notes are given of 9 cases, 5 being in women. Treatment appropriate to the symptoms will be found in the employment of calomel, salicylate of soda, and rhubarb, with antipyretics. Cholecystotomy was performed in one case, with removal from the gall-bladder of 50 cc. of thick dark bile, of which, apparently, no bacteriological examination was made. The patient's man aged 55, died suddenly on the following day, during the dressing of the wound. In a second case, that of a woman aged 24 years, sudden death took place on the 20th day of the disease, from syncope, no autopsy being obtained. The other cases got well.

J. B. N.

SPAGNOLIO (Giuseppe). **Nuovi casi clinici di spleno-epatomegalia febbrile da virus ignoto.** [Further Cases of Febrile Enlargement of the Spleen and Liver of Unknown Origin.]—*Malaria e Malat. d. Paesi Caldi.* 1916. May-June. Vol. 7. No. 3. pp. 145–151.

Professor GABBI and the author have already placed on record cases of disease in children from Southern Italy and Sicily, in which the clinical picture of kala azar is practically complete, with the exception that it was impossible to demonstrate the parasite of kala azar, or any other infective agent, either in the blood or in the tissues of the liver or spleen, at any rate during life. Two more cases are now added to the list.

Case 1. A female child, aged 6 years, born in Calabria. Family history unexceptionable. No proof of syphilis in the father, who had a negative Wassermann reaction. In April 1913, after a fright, the health of the child became impaired. The temperature rose above the normal every night, and fell towards morning with profuse sweating. The medical attendant detected enlargement of spleen and diagnosed malaria, although the locality in which the child lived was not malarious. Treatment with quinine was without effect, and eventually the child was sent to Rome, to the Clinic for tropical diseases, on a suspicion of leishmaniasis, in December of the same year. On admission, the child was noted to be pallid and emaciated, with a purpuric eruption which was most copious on the lower limbs. The temperature was above normal, and the pulse 120 per minute. There was no enlargement of the glands of the neck. The thoracic organs appeared free from disease, but the abdomen was swollen and the liver and spleen were both much enlarged. No fluid could be detected in the abdominal cavity. The inguinal glands were enlarged. The urine was turbid and contained one per mille of albumin and a sediment of blood corpuscles, casts and renal epithelium. In the stools there were neither worms, nor ova. The haemoglobin of the blood was reduced to 35 per cent. of the normal, and the red cells to 2,200,000 per cmm. The leucocytes amounted to 4,400 per cmm. Cutaneous tubercle reactions were negative; Wassermann ditto. A splenic puncture revealed no trace whatever of Leishman bodies, nor of malarial parasites. Blood cultures of every kind were also negative. After two months stay in hospital, during which a haemorrhagic otitis of both ears occurred, the child left, and after further treatment elsewhere died in October of the same year, i.e., after an 18-months' illness. No autopsy could be obtained. Monkeys not being available, inoculation experiments were tried with dogs and rabbits during the child's stay in hospital, but without result.

Case 2.—A boy, aged 14 years, a native of Messina. Family history good. Personal history also good, until the age of 12 years, when a severe attack of erysipelas left some delicacy behind it. In November, 1915, the child began to suffer from loss of appetite and debility, and hectic fever. Enlargement of the spleen was noticed, with pallor of the skin and mucous membranes. In the month of March following, petechiae appeared on the limbs and trunk, and also gingivitis and swelling of the palate, which culminated in noma of which the patient died. An autopsy was not obtainable, but the physical signs of disease in the viscera were practically the same as in the preceding case. All sero-diagnostic and other laboratory examinations were quite without a positive result.

It appears to the author that these two cases should be put on record.

J. B. N.

FUSCO (Pietro P.). **Fegato e cirrosi dispeptica in Tripolitania (Morbo di Budd).** [Dyspeptic Cirrhosis of the Liver (Budd's Disease) in Tripoli.]—*Malaria e Malat d. Paesi Caldi.* 1916. Apr. 20. Vol. 7. No. 2. pp. 69–79. With 1 text-fig.

According to the author the diet of the native Arab in Tripoli is so poor that for months together the people have to live on the grass, which forms the forage for their horses and camels. This is cooked with pepper and other spices in sheep's fat; the latter being often rancid. The result is the production of the so-called "dyspeptic liver" of E. BOIX and others, of which the exciting cause is the butyric or other fatty acid present in the rancid oil or fat used by the Arab. The disease, as might be expected, is mostly found in men of middle age, and the author gives an illustration of a patient with the area of his liver and spleen mapped out by dark lines. On an appropriate diet, especially of milk, in a hospital, and with the aid of iodides and purgatives, the condition quickly improves. The author goes on to point out that a similar condition can arise in Europeans who, in a hot climate, make use of spicy and fatty foods, and do not take exercise, and in Tripoli the condition is not unfrequently seen in European colonists, who do not adapt themselves to the climate in matters of feeding and personal exercise. In particular, the habit of sleeping too much in the day time, after the mid-day meal, is condemned, it being a matter of fact that those who lead the most active lives are those who enjoy the best health, in tropical countries. Pathologically, the condition consists in a hypertrophy of the connective tissue septa between the lobules of the liver, around the branches of the portal vein, the liver cells themselves remaining for the most part intact.

[The Anglo-Indian practitioner is, of course, quite familiar with the condition of things here described.]

J. B. N.

BALFOUR (Andrew). **The Treatment of Hepatic Failure in Yellow Fever, Malaria and Other Conditions: A Suggestion.**—*Lancet.* 1916. May 20. pp. 1038–1039.

In a case of multiple liver abscess which the author described twelve years ago he believed that death was due to shock, but afterwards concluded that the cause of the fatal result was delayed chloroform poisoning. He believes that similar symptoms may occur in tropical diseases where the liver fails to perform its functions, e.g., yellow fever, epidemic jaundice, Weil's disease, blackwater fever, certain forms of fatal malaria. The symptoms associated with the destruction of liver cells are thus stated :—

> "They are chiefly of cerebral origin, pointing to a poisoning of the higher nerve centres. The patient begins to grow restless, watchful, excited, anxious, and light-headed. He complains of severe headache and, it may be, of photophobia. He wanders in his mind and suffers from an incoherency of ideas and from hallucinations. His muscles twitch and tremble and delirium ensues. It may be of a low, muttering type, or may become active, the patient trying to get out of bed, but it is not usually very violent, for there is great weakness. Convulsions may set in, and if cardiac or respiratory failure does not occur coma ends the scene. In addition, we find that if jaundice is already present it deepens, while hiccough, clammy sweats, and anuria are not infrequent."

These symptoms have been attributed to the toxins of the virus causing the disease and no attempt has been made to treat the serious liver condition. Attention is drawn to STERNBERG'S treatment in yellow fever and the alkaline treatment applied with success in blackwater by BURKITT [see this *Bulletin,* Vol. 7, p. 29]. The acidosis in this condition is due to the fatty acids being poured into the blood owing to the disordered hepatic condition. Balfour thinks that on the lines suggested by Col. W. HUNTER we may go farther and endeavour to prevent or at least cut short the rapid destruction of liver cells. A synopsis is given of Col. HUNTER'S views :—

> "He believes that in such diseases the antitoxic functions which the liver cells discharge in relation to the portal blood are first of all depressed and then suppressed by the poisons generated by the disease viruses. Strain is thrown on the liver cell. It endeavours to maintain its energy by taking up carbohydrate material. If sufficient cannot be obtained from sugar it turns to fat, and when this also fails to yield the supply to tissue proteins. There is thus increased fat metabolism with acidosis and acetonuria, and the liver cell, coming under the influence of its own ferments, undergoes autolysis and thus presents the characteristic appearances seen post mortem. Colonel Hunter further thinks that ammonia, as a rule, keeps the ferments in check, and that the practice, common alike before operations and in the early stages of febrile diseases, of purging the patient with calomel and of withholding food, prevents the formation of ammonia and thus the hepatic ferments have full play. As already stated, the liver cells being thus thrown out of action fail to deal with the poisonous portal blood. The latter passes unchanged into the general circulation and the characteristic cerebral symptoms result. . . .

Balfour continues :—

> "Colonel Hunter's theory and researches have certainly led to one important practical conclusion, i.e., the necessity in cases of delayed chloroform poisoning and toxaemic jaundice of keeping up the supply both of sugar and of protein food, the latter in peptonised form. The former is ensured by the administration of glucose. It can be given by the mouth or as rectal enemata, solutions of 5 or 10 per cent. being used. If pure glucose cannot be obtained, preserved (candied) fruits may be given, or, indeed, sugar in any form. The necessity for protein is met by administering enemata of peptonised beef-tea, eggs, or other protein material."

This line of treatment is suggested for such diseases as yellow fever and bilious remittent fever, when jaundice is an important feature.

A. G. B.

LONGRIDGE (C. Nepean). **Cases of Acute Yellow Atrophy of the Liver treated by Injections of Sodium Bicarbonate ; Recovery.**—*Jl. Roy. Army Med. Corps.* 1916. June. Vol. 26. No. 6. pp. 812–814.

The patient, a man of 25, was admitted to the Giza Hospital, Egypt, from Gallipoli on October 10th, 1915, having been taken ill on October 1st. His symptoms were not severe and he was believed to be suffering from epidemic catarrhal jaundice.

> "On October 13th marked icterus had developed, the water was mahogany-coloured and the stools like clay ; temperature normal, liver dullness normal. The following morning he had a severe fainting attack for no ascertainable cause, and complained of pain in the epigastrium. He vomited occasionally and was obviously ill ; the jaundice had increased and the liver dullness was found to extend from fifth space in nipple line to just below the costal arch. He was ordered a drachm of glucose in five ounces of water every four hours by the rectum, and a drachm of sodium

bicarbonate in two ounces of water every two hours by the mouth. A specimen of water was examined and found to contain large quantities of leucin and tyrosin. The temperature was subnormal and the pulse 70, of good quality.

“On October 15th the patient was no better. He had continued to vomit bilious fluid, the bowels had acted and the motions contained a small quantity of blood; the tongue was clean, but the man was violently delirious, and the liver dullness had descended to the sixth space in the nipple line. The injections of glucose into the rectum were continued with difficulty and could not be given regularly. The sodium bicarbonate was now administered hypodermically, 100 cubic centimetres of a two per cent. solution being injected morning and evening.

“The delirium continued throughout the night and the next day; there was incontinence of urine and faeces, some blood was noticed in the vomit, which was now less frequent. . . . Only a few ounces of very dark urine were passed. The injections of sodium bicarbonate were continued to the exclusion of everything else. . . . On the following morning (October 17) the patient was conscious and had slept a few hours, the pulse improved and the liver dullness had gone up half an inch to the sixth space. Over 200 cubic centimetres of alkaline urine were passed, still containing leucin and tyrosin.”

Thereafter the patient made an uninterrupted recovery. The author records this case “because in the opinion of Col. HUNTER and Major Llewellyn PHILLIPS it was one of acute yellow atrophy, and the injections of sodium bicarbonate were the probable cause of the favourable termination.”

A. G. B.

PIJPER (A.). **Preliminary Note on a Case of Thrush-like Disease due to *Monilia rugosa* Castellani, 1910.**—*Jl. Trop. Med. & Hyg.* 1916. Nov. 1. Vol. 19. No. 21. p. 249. With 1 text fig.

The author, who writes from Bethal, South Africa, was called to see a child who presented numerous whitish thrush-like patches on the oral mucosa. One of these was inoculated on Sabouraud's agar and “after two or three days a growth developed which had the macroscopical aspect of *Monilia rugosa*, Castellani.” The growths, which are illustrated, show the characteristic crinkled surface. The author believes he has found asci in the growth, a finding which would necessitate the transfer of the species from the genus *Monilia*. He gives an account of the cultural characters and biochemical reactions.

A. G. B.

CASTELLANI (Aldo). **A Case of Vaginitis probably due to *Monilia pinoyi* Cast. 1910.**—*Jl. Trop. Med. & Hyg.* 1916. Apr. 15. Vol. 19. No. 8. pp. 89–90. With 2 figs.

“In a case of vaginitis [in a Singhalese woman] with thick purulent discharge and no thrush-like patches on the mucosa, a fungus was grown with all the characteristics of *Monilia pinoyi*, Cast., 1910. This fungus was probably the cause of the condition.”

M. pinoyi was originally found in sputum. There is a figure of the fungus and of a glucose-agar culture.

A. G. B.

TROPICAL DISEASES BUREAU LIBRARY.

JOURNALS.

NOTE.—The date and volume number following the title indicate the earliest volume of the series which the library possesses. Dashes after the date and volume number indicate that the intervening parts (unless otherwise stated) are complete to the date of publication of this list.

Series which are complete from the commencement are italicised.

Some of the foreign journals are not up to date.

EUROPE.

GREAT BRITAIN.

Annals of Tropical Medicine & Parasitology (Liverpool)	1907—	Vol. 1—
British Medical Journal (London)	1878—	
Bulletin of Entomological Research (London)	1910—	Vol. 1
Edinburgh Medical Journal (Edinburgh)	1908—	(New ser.) Vol. 1—
Glasgow Medical Journal (Glasgow)	1909—	Vol. 71—
Journal of the Board of Agriculture (London)	1913—	Vol. 20—
Journal of Comparative Pathology & Therapeutics (Edinburgh & London)	1908—	Vol. 21—
Journal of Hygiene (Cambridge)	1901—	Vol. 1—
Journal of Pathology & Bacteriology (Cambridge)	1892—	Vol. 1— [Vols. 1, 8 & 11 incomplete]
Journal of the Royal Army Medical Corps (London)	1903—	Vol. 1—
Journal Royal Naval Medical Service (London)	1915—	Vol. 1—
Journal of State Medicine (London)	1913—	Vol. 21—
Journal of Tropical Medicine & Hygiene (London)	1898—	Vol. 1—
Lancet (London)	1888—	
Lister Institute. Collected Papers (London)	1904—	Vol. 1—
Parasitology (Cambridge)	1908—	Vol. 1—
Proceedings of the Royal Society, Series B. (London)	1905—	Vol. 76—
Public Health (London)	1908—	Vol. 22—
Reports of the Sleeping Sickness Commission of the Royal Society (London)	1903—	No. 1—
Review of Applied Entomology. Series A: Agricultural. Series B: Medical & Veterinary (London)	1913—	Vol. 1—
Transactions of the Society of Tropical Medicine & Hygiene (London)	1907—	Vol. 1—
Veterinary Journal (London)	1909—	Vol. 65—
Veterinary News (London)	1910—	Vol. 7—
Veterinary Record (London)	1912—	Vol. 25—

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† Not received since 1915.

FRANCE.

†*Annales d'Hygiène et de Médecine Coloniales (Paris)*	1898—	Vol. 1—
Annales de l'Institut Pasteur (Paris)	1897—	Vol. 11—
Archives de Médecine et Pharmacie Militaires (Paris)	1914—	Vol. 63—
Archives de Médecine et Pharmacie Navales (Paris)	1907—	Vol. 88—
†*Archives de Parasitologie (Paris)*	1898—	Vol. 1—
Bulletin de l'Institut Pasteur (Paris)	1903—	Vol. 1—
Bulletin de l'Office International d'Hygiène Publique (Paris)	1909—	Vol. 1—
Bulletin de la Société de Pathologie Exotique (Paris)	1908—	Vol. 1—
Bulletins et Mémoires de la Société Médicale des Hôpitaux de Paris(Paris)	1913—	(3 ser.) Vol. 29—
Caducée (Paris)	1913—	Vol. 13—
Comptes Rendus de la Société de Biologie (Paris)	1903—	Vol. 55—
†Gazette des Hôpitaux Civils et Militaires (Paris)	1914—	Vol. 87—
Recueil de Médecine Vétérinaire (Alfort)	1913—	Vol. 90—
†Répertoire de Police Sanitaire Vétérinaire (Paris)	1913—	Vol. 29—
†*Revue de Médecine et d'Hygiène Tropicales (Paris)*	1904—	Vol. 1—
Revue Générale de Médecine Vétérinaire (Lyons)	1913—	Vol. 21—
†Revue Vétérinaire (Toulouse)	1913—	Vol. 38—

GERMANY.

†Arbeiten aus dem Kaiserlichen Gesundheitsamte (Berlin)	1913—	Vol. 43—
Archiv für Protistenkunde (Jena)	1913—	Vol. 30—
Archiv für Schiffs- und Tropen-Hygiene [& †Beihefte] (Leipzig)	1897—	Vol. 1—
†Berliner Tierärztliche Wochenschrift (Berlin)	1914—	Vol. 30—
Centralblatt für Bakteriologie (Jena) 1. Abteilung. Originale	1912—	Vol. 65—
Referate	1909–14	Vol. 43–60
Dermatologische Zeitschrift (Berlin)	1915—	Vol. 22—
†Deutsche Medizinische Wochenschrift (Berlin)	1909—	Vol. 35—
†Deutsche Militärärztliche Zeitschrift (Berlin)	1910—	Vol. 39—
†Deutsche Tierärztliche Wochenschrift (Hanover)	1913—	Vol. 21—
†Lepra (Leipzig)	1913—	Vol. 14—
†Mitteilungen aus dem Zoologischen Museum in Berlin (Berlin)	1910—	Vol. 4—
Münchener Medizinische Wochenschrift (Munich)	1914—	Vol. 61—
†*Zeitschrift für Chemotherapie und Verwandte Gebiete. 1. Teil., Originale (Leipzig)*	1912—	Vol. 1—
Zeitschrift für Hygiene und Infektionskrankheiten (Leipzig)	1912—	Vol. 72—
Zeitschrift für Immunitätsforschung und Experimentelle Therapie (Jena)	1908—	Vol. 1—
†Zeitschrift für Veterinärkunde (Berlin)	1913—	Vol. 25—

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†Not received since 1915.

ITALY.

Annali d'Igiene [formerly Annali d'Igiene Sperimentale] (Turin)	1912—	Vol. 22—	
Annali di Medicina Navale e Coloniale (Rome)	1908—	Anno 14—	
†Atti della Società per gli Studi della Malaria (Rome)	1906, 1907, 1909—	Vols. 7, 8, 10—	
†*Annali della Stazione Sperimentale per le Malattie Infettive del Bestiame (Naples)*	1911—	Vol. 1—	
Bollettino della Società Medico Chirurgica di Modena (Modena)	1914—	Vol. 16—	
Clinica Veterinaria (Milan)	1913—	Vol. 36—	
†Gazzetta Internazionale di Medicina, Chirurgia, Igiene, &c. (Naples)	1913—		
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Scientific Memoirs by Officers of the Medical & Sanitary Departments of the Government of India (Calcutta)	1902-1913	(New ser.) Nos. 1-60
Yellow Fever Bureau Bulletin (Liverpool)	1911-15	Vols. 1-3

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ANALES DEL HOSPITAL DE SAN JOSÉ, 1916. Nov. Vol. 2. No. 1. San José, Costa Rica: Imprenta Libreria y Encuadernacion Alsina.

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BOSANQUET (W. C.) [M.A., M.D. Oxon., F.R.C.P., Lond.] & EYRE (John W. H.) [M.D., M.S. Dunelm., F.R.S. Edin.] Serums, Vaccines and Toxins in Treatment and Diagnosis.—3rd Edit., viii + 456 pp. cr. 8vo. With 17 text-figs. and 3 charts, 1916. London: Cassell & Co., Ltd. [Price 9*s.* net.]

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Vol. 9. 1917. No. 2.

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Vol. 9.] 1917. [No. 2.

UNCLASSED FEVERS OF TROPICS AND DENGUE.

de Mello (F.), Borcar (A.) & de Sousa (L.). **Contribution à l'étude des fièvres remittentes de l'Inde Portugaise.** -*Anais Scientificos da Faculdade de Medicina do Pôrto.* 1916. Vol. 3. 41 pp.

The authors in Part 1 of this monograph give a history of the remittent fevers of Portuguese India and show that for a long time enteric fevers were considered to be absent. By systematic enquiry it was found that there were many fevers of long duration which were uninfluenced by quinine, were contagious and associated with intestinal haemorrhages, and evidently belonged to the typho-colon group. Further studies were carried out for the identification and isolation of the pathogenic agents, and in two instances the *B. Columbense* of Castellani was found. Statistics of age incidence for evidence of immunity showed a large proportion of the cases to be in early adult life, and many diagrams of the curves obtained are given in part 2 for the years 1912 13, and 1914.

Part 3 gives the results of their serological studies. They found that the Widal reaction was most useful as a group test to differentiate enteric from other fevers, but of little value in separating the typhoids and paratyphoids. In unvaccinated persons they recognised three groups:—

(*a*) Plus reactions for typhoid with negative for paratyphoids.
(*b*) Plus reaction for typhoid and for paratyphoids.
(*c*) Plus reaction for typhoid and higher for paratyphoids.

The highest agglutination titre did not always indicate the infecting agent, early infections sometimes giving lasting and high immunity reactions. The clinical characters with charts of twelve cases are given. The remittent fevers of the country can be divided into three classes. (1) Fevers of classical type; (2) Fevers differing from the above but all showing nervous, pulmonary, and enteric symptoms; (3) Fevers of remittent character with no visceral complications. The two last groups, called "Climatic fevers," can be diagnosed by laboratory methods only and the authors come to the conclusion that most of these are infections by the typho-paratyphoid group of organisms.

P. W. Bassett-Smith.

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STRESINO (AURELIO). Un caso di "febbre bottonosa" a Bengasi.—*Malaria e Malat. d. Paesi Caldi.* 1916. July–August. Vol. 7. No. 4. pp. 230–232. With 1 chart.

The author gives in detail a further case of "Macular fever" from Tunis, which was first described by CONOR and BRUCH in 1910 and later by GABBI in 1912 [see this *Bulletin*, Vol. 2, p. 109, and Vol. 3, p. 330].

The pyrexia, which at the onset was severe, lasted eight days, the temperature falling by lysis, and the eruption appeared on the third day associated with intense headache and general muscular and articular pains. The eruption was papular and petechial in character, especially abundant over the radial articulation of the wrist, the palms of hands, the abdomen and feet. No relapse occurred and convalescence was rapid. A blood examination gave the red cells as 4,550,000 and white as 6,500 per cmm., the polynuclear cells being relatively low, 60 per cent. The diagnosis had to be made differentially from typhoid and dengue.

P. W. B-S.

MCWALTER (J. C.). A Note on Salonika Fever.—*Med. Press & Circ.* 1916. Aug. 9. Vol. 102. N.S., No. 4031. pp. 122–123.

The author, serving with the Mediterranean expeditionary force, draws attention to a severe fever prevalent at Salonika of indefinite duration and high mortality, in which prostration and delirium are very marked features. He describes the disease as a cross between malaria and enteric, aggravated by broncho-pneumonia. Malarial parasites are present in the blood and the Peyer's patches may be inflamed and even ulcerated, but the spleen is not markedly enlarged and there is no periodicity.

In post-mortems the evidence of enteric, malaria, and pneumonia are much less marked than the clinical symptoms had indicated; in some cases signs of chronic dysentery were present. Some of the most severe types of the fever have been diagnosed as sunstroke.

In discussing treatment the author lays great stress upon the unfavourable predisposing causes which are present—climate, depression and lack of vitamines. "Where patients have been living for ten or twelve months in a hot, dusty, insanitary environment on canned beef, canned mutton, canned soup, canned jam, dry biscuits, canned milk, canned rice and chlorinated water, and you take them to hospital where they get canned milk, frozen beef, frozen chickens, frozen rabbits and tinned fruits it is difficult for the blood to become charged with that fresh abounding vitality which would enable it to shake off a fever." Quinine was most useful but could not be called a specific.

[The malarial fevers which abound in the Salonika region are chiefly due to the malignant type of parasite and pernicious symptoms are common, simulating sunstroke, dysentery, etc.; the reviewer knows from personal experience that these cases are often very resistant to quinine and difficult to cure. It is therefore probable that the Salonika fever here described is generally due to a heavy infection of *Laverania malariae*, occasionally complicated with enteric.]

P. W. B.-S.

WEITZ. **Ueber zwei Fälle von Fünftagefieber.** [Two Cases of Five Day Fever].—*Med. Klinik.* 1916. June 18. Vol. 12. No. 25. p. 659.

Professor WERNER at a meeting of Health officers at Warsaw reported a peculiar illness which he called five-day fever. The attacks of pyrexia last for 24 to 48 hours and the interval between them is five to six days. Similar cases have occurred in areas remote from the eastern frontier and the author describes two; one at Hamburg and one in a field hospital in northern France. Case one was a ward maid aged 36; she had felt pain in the left elbow joint for four weeks and looked ill; she was admitted to hospital. The tongue was coated, there was tenderness over the lumbar vertebrae and especially over the external condyle of the right arm; nothing else abnormal was detected. There were five pyrexial attacks lasting 48 hours each, the intervals between them being five days; recovery was complete. The second case was a soldier who complained of abdominal pain, headache, and giddiness; he was sent into hospital from the trenches. There the symptoms were fever, tenderness of the spinal column and fibula, with pain over the epicondyle of the left arm. There were four attacks of pyrexia each lasting 48 hours with five-day intervals. Recovery was complete.

The similarity of the cases is very marked and the likeness to those described by WERNER definite. No cause could be traced but the condylar pain was probably due to circumscribed periostitis.

[Five-day fever is a most unsatisfactory term to distinguish this fever, the time element being useful for diagnosis but not good for nomenclature, and we now have "3-day fever," "5-day fever," "6-day fever," and "7-day fever," for phlebotomus fever and various types of dengue. Volhynia fever is preferable.]

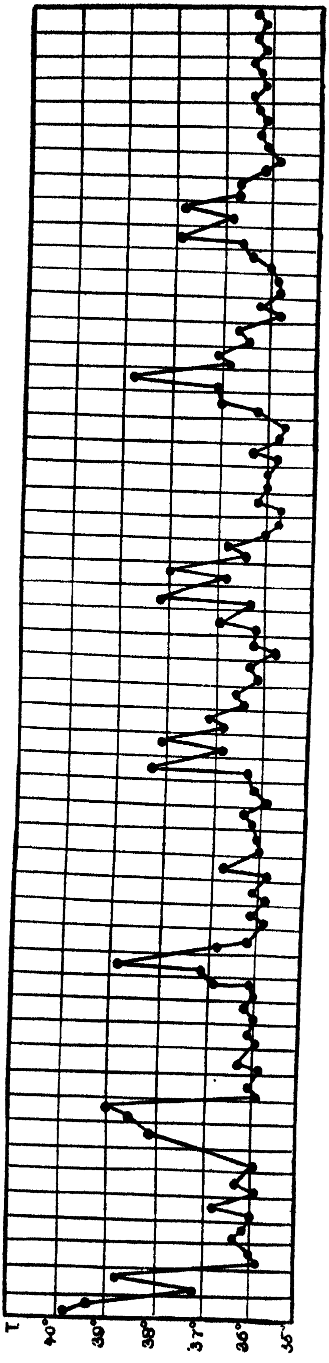
P. W. B-S.

WERNER (H.) & HAENSSLER (E.). **Ueber Fünftagefieber, febris quintana.**—*München. Med. Woch.* 1916. July 11. Vol. 63. No. 28. pp. 1020–1023. With 24 charts.

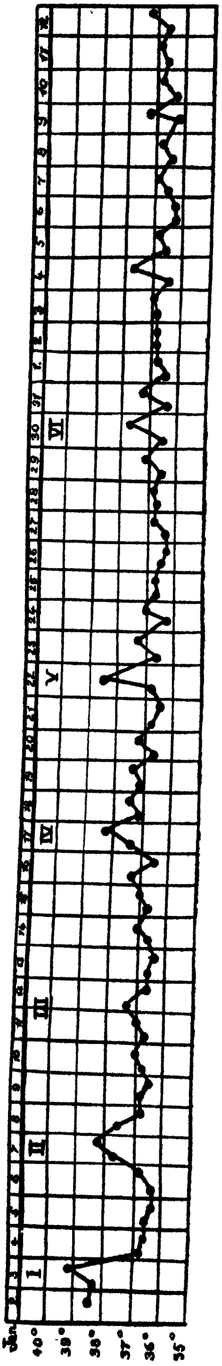
Werner, who originally reported cases of this fever, now describes in detail the course of the disease and illustrates this with a large number of temperature charts [see Chart] and reports of cases. It is noted that irregularities of the typical course are found and some cases have little or no fever but all the other associated symptoms; this the authors call the "equivalent" of an attack. The subjective complaints are pains in the muscles, chiefly of the lower extremity, and to a less degree in the bones, which, though worst during the febrile paroxysm, do not completely cease in the intervals and remain for weeks during convalescence. Headache is marked, often with eyeball pain. Objectively enlargement of the spleen is noticed, which the author states might be due to antityphoid inoculation. Blood examinations show no change in the red cells but there is generally a marked polymorphonuclear leucocytosis with the rise of temperature. An investigation into the etiology has not been very successful. Bacteriological examination of the blood gave in two cases a short bi-polar rod of doubtful importance, and in one case a drop of blood taken at the height of a paroxysm and stained with Giemsa showed a form of spirochaete whose length was about 10μ, but as no others were detected in hundreds of films examined, it cannot be taken as conclusive evidence.

FIVE DAY FEVER.

Moltrecht.]



Werner.]



Attempts to inoculate mice, guinea-pigs and dogs were unsuccessful, and two subcutaneous injections of the blood into man gave no results. Later Werner was able to infect two men by intramuscular injections, the incubation periods being 20 and 24 days (details to be reported later). From its clinical characters the disease resembles a form of relapsing fever and is probably due to a spirochaete conveyed by lice.

MOLTRECHT. **Beiträge zur Kenntnis des Fünftagefiebers.** [Contribution to the Knowledge of Five Day Fever.]—*München. Med. Woch.* 1916. July 25. Vol. 63. No. 30. pp. 1097–1098. With 1 chart.

This disease, sometimes called Volhynia fever from the place where it was first observed, appears to be more common than was at first believed. It shows a marked periodicity, having usually a period of five days between the height of one paroxysm of fever and the next [see Chart], each attack lasting about 48 hours, associated with rheumatic pains, etc. The author has had the opportunity of seeing many cases and describes the symptoms fairly fully. He remarks upon the prolonged debility which follows a so relatively trifling disease. There are few physical signs, the most important being some enlargement and tenderness of the liver and spleen.

Blood examinations gave no clue to the cause. For treatment he found pyramidon gave the best results; quinine and aspirin were useless. He was not able to ascertain whether fleas or lice, from which the men are never completely or permanently free, acted as "carriers." Cases are sometimes reported as "Five-day fever without fever." This can only lead to confusion, and the author suggests that the term "Russian intermittent fever" would perhaps be better.

P. W. B-S.

STIEFER (G.) & LEHNDORFF (A.). **Ikwa Fieber.**—*Med. Klinik.* 1916. Aug. 20. Vol. 12. No. 34. pp. 898–900. With 7 charts.

The author reports 38 cases of recurring fever which developed on the Ikwa, a river of Volhynia. The course of all was very similar—sudden onset, high fever lasting 2–3 days, intense pains chiefly in shin bones, and relapses after 3–5 days, each relapse tending to get less severe. Among 30 cases 7 showed two relapses, 10 three, 6 four, 6 five, and one case seven. Splenic enlargement was generally noticed. The blood showed a slight leucocytosis and marked eosinophilia, 6–14 per cent. For treatment pyramidon was valuable. It was important etiologically that when the men were removed from the endemic area no fresh cases occurred, but fresh troops moved to the area quickly developed the disease. There was strong evidence against contact infection, but the facts point to conveyance of the virus by some insect, probably lice, as the disease occurs in the winter months.

[This disease is probably a form of that already described as Volhynia, or Russian relapsing fever.]

P. W. B-S.

Piazza (C.). Un nuovo caso di Sodoku. [Contribution to the Study of Rat-Bite Fever.]—*Morgagni.* 1916. Feb. 29. Vol. 58. pp. 67–80.

The author gives a resumé of knowledge of the disease as seen in China, Japan, Europe and America and details the chief characteristics which have been noted by different observers. He then describes a case of his own: that of a man, aged 48, a native of Verona, who was bitten by a rat on May 28th. The initial lesion, on the leg, was slight and soon healed but on the fourteenth day after, the wound became irritable, tumified and painful; secondly lymphatic inflammation followed, with fever, prostration, anorexia, and articular pains. He was admitted into hospital on June 17th. A small ulcer was then present at the site of the bite but there was no cutaneous eruption and very few subjective or objective signs. Blood examinations gave negative results during a nonfebrile period but during a paroxysm of the fever there was a slight leukocytosis and a marked eosinophilia (7 to 14 per cent.) He was treated with neosalvarsan, 30 and 60 cgm., and made a good recovery. The chief points were, the long period of incubation, the nonsuppurative character of the secondary inflammation, the lymphatic implication and the subsequent pronounced asthenia. A guinea-pig was inoculated with 3–4 cc. of the patient's blood but gave no definite results. No blood parasites were found. Ova of ascarides were found in the faeces.

P. W. B-S.

Wolbach (S. B.). The Etiology of Rocky Mountain Spotted Fever. Occurrence of the Parasite in the Tick. (Second Preliminary Report.)—*Jl. Med. Res.* 1916. Sept. Vol. 35. No. 1. pp. 147–150.

In March 1916 the author reported the presence of peculiar parasitic bodies in monkeys and guinea-pigs infected with Rocky Mountain spotted fever [this *Bulletin*, Vol. 8, p. 284]. In the present paper he reports the presence and distribution of the parasite in experimentally infected ticks, *Dermacentor venustus* Banks. Each tick was allowed to feed for two to five days on the shaved skin of the infected guinea-pig. One half of the tick, with salivary gland, Malpighian tube, leg muscles, and part of intestinal diverticulum was examined in smear preparations stained by Giemsa, or by dark field illumination; the other part in embedded specimens. In infective ticks parasites was found similar to those previously observed in tissues of monkeys and guinea-pigs, but never in non-infective ticks. The parasites were present most abundantly in the striped muscle, but also in the Malpighian tubes, salivary glands and ducts, and brain ganglia. They were numerous in the muscle fibres of the uterus and vagina, and have been seen in the spermatozoa. Morphologically two types were observed. One, a lanceolate diplococcoid organism which stains fairly deeply with chromatin characteristics, the second a small rather slender rod shape form, poor in chromatin staining material, which may contain bipolar or more numerous granules. A third minute oval coccoid form was also observed staining blueish with Giemsa; these are often very abundant within the cells and are too compact to be resolved except at the periphery of the clumps. The lanceolate form is the only one generally found in the circulating blood of infected animals and probably represents the most resistant stage. It is non-motile as seen by dark ground illumination. A more detailed report of the experimental work will shortly be published.

P. W. B-S.

PUBLIC HEALTH REPORTS. 1916. Oct. 6. Vol. 13. No. 40. pp. 2753–2754.—**Rocky Mountain Spotted Fever in California.**

Dr. F. L. KELLY, Assistant Entomologist, of the California State Board of Health, reports 38 cases of Rocky Mountain Fever, 6 in Modoc County and 32 in Lassen County, with a mortality of one in the former and six in the latter, between 1903 and 1916. He gives the following conclusions :—

"(1) Rocky Mountain spotted fever has existed in California for a much longer period and to a far greater extent than has hitherto been supposed.

"(2) There are probably five main infected areas, one in Modoc County and four in Lassen.

"(3) The disease is not as severe in California as in Montana, nor as light as in Idaho.

"(4) The infection probably entered California through Nevada rather than Oregon."

P. W. B-S.

NEWSTEAD (R.). **On the Genus Phlebotomus. Part 3.**—*Bull. Entomol. Res.* 1916. Oct. Vol. 7. No. 2. pp. 191–192. With 1 text-fig.

The author gives a technical description of *P. major* var. *chinensis*, which he states differs in some of its characters from that of *P. major* Annandale, particularly in the superior claspers and the palpi of the male. The specimens of the species were obtained from the Western hills, Pekin and from Ting Chow twelve miles east of Pekin. Five female examples of a possibly new species were also obtained from the same localities.

P. W. B-S.

LANGERON (M.). **Les Phlébotomes dans la région parisienne.**—*Bull. Soc. Path. Exot.* 1916. Oct. Vol. 9. No. 8. pp. 573–576.

The genus Phlebotomus is very widely distributed but it is found mostly in warm climates. Recent observations by BLANCHARD, LESNE, AUBERT, LEGENDRE and others have demonstrated its presence in the Alpes Maritimes, Côte d'Or, Northern Italy, Switzerland and the valley of the Somme. At Bourg-la-Reine, South of Paris, females of *P. papatasii* were seen and taken during the hot months by the author. The phlebotomus probably extend up the valley of the Rhone and the Saone from Lyon and Beaune, and pass up the valley of the Doubs. Doubtless it occurs in Alsace and the valley of the Rhine where the climate is mild. It is found also in the valley of the Seine and probably in the basin of the Loire and the west of France, regions separated from the former by high mountains.

P. W. B-S.

CLELAND (J. B.), BRADLEY (B.) & MCDONALD (W.). **On the Transmission of Australian Dengue by the Mosquito *Stegomyia Fasciata*.**—*Med. Jl. of Australia.* 1916. Sept. 2 & 9. Vol. 2 (3rd year). Nos. 10 & 11. pp. 179–184 & 200–205. With 4 charts.

In March 1916 an epidemic of dengue, which was present in Queensland, appeared in some of the northern coast towns of New South Wales and particularly at Murwillumbah. An investigation as to the aetiology and means of prevention was ordered by the Minister of Public Health. In an early report [see this *Bulletin*, Vol. 8, p. 280] the authors concluded that the disease was spread by the *Stegomyia fasciata*, but the experiments were unsatisfactory as they were conducted in the endemic locality.

In the present paper are detailed fresh experiments which are not open to this objection and were made with the greatest care and exactitude. Two series of mosquitoes, one of Stegomyia and one of Culex, were collected in the locality; these had become infected by feeding on acute cases on the first and second day of the disease, and were brought in separate boxes to Sydney and there allowed to feed upon non-immune persons in that town, where no dengue existed.

The first series of experiments was negative, the reason for which is promised in a future report. In the second series 100 Stegomyia and 112 *Culex fatigans* were collected at Mullumbimby, nine persons at Sydney volunteering for the experiments.

Several of the subjects were exposed to infection from the mosquitoes on more than one occasion, which, however, did not interfere with the deduction drawn of the incubation period, as they were controlled by cases infected only on one occasion. In four out of the seven cases the results were successful, the patients developing typical dengue after a period of 6–9 days from being bitten; the temperature showed the double rise and a characteristic rash appeared (shown in a coloured plate). Marked itching was noted after the rash; this symptom they considered pathognomonic of dengue in a febrile complaint accompanied by a rash. Two of the successful cases had never been in a dengue locality and the other two, not for a time considerably longer than the incubative period. Blood taken from three of the successful cases reproduced the disease when injected into further non-immune persons. Two persons were bitten by the specimens of *Culex fatigans* brought from the infected district; though these were frequently fed on them they did not develop the disease. No known instance of contagion occurred from any of the successful cases. The authors therefore conclude that the disease is only conveyed by the *Stegomyia fasciata* after an incubative period of 5–9½ days. They regret that they were unable to elucidate many other important points owing to the stress of war work at the time. The paper however gives a very excellent account of experiments carefully planned and carried out, and proves conclusively that in Australia the infecting mosquito of the disease known there as dengue is the *Stegomyia fasciata*. The authors throw grave doubts on the transmission of the disease through *Culex fatigans* (ASHBURN and CRAIG, 1907).

P. W. B-S.

MALARIA.

Gill (Clifford A.). **Malaria in Muscat.**—*Indian Jl. Med. Res.* 1916. July. Vol. 4. No. 1. pp. 190–235. With 4 plates, 2 maps & 1 chart.

This report of observations continued during 13 months, from December 1914 to January 1916, is a fine piece of work—perspicacious, lucid, concise and, so far as political and service conditions permitted, remarkably complete.

In the interesting, ably-written, and well-illustrated preliminary sections dealing with physical topography, hydrography, geology, meteorology, etc., the author gives a picture of a sultry, barren, arid waste which on a priori grounds would not be regarded as malarious. But as this desert tract has, from its propinquity to the ocean, a decidedly humid atmosphere, and—lying at the foot of lofty mountains—contains a good deal of ground-water, which is tapped by wells and subterranean aqueducts; as also there is an appreciable rainfall (the annual average during eight recorded years being 4·5 inches); and as there are nullahs, and hollows in impermeable volcanic rock, where pools of rainwater may resist the process of evaporation for some months; the accommodation for mosquitoes is unexpectedly good. The author discovered the larvae of five species of Anopheles, namely, *culicifacies*, *funestus*, *stephensi*, *rhodesiensis*, and *cinereus*, the first three of which are notorious malaria carriers. Furthermore, the endemic indications of malaria, so far as the condition of the spleen could be investigated in the children of a diffident population, were high, and tertian parasites (chiefly the malignant variety) were found in the blood of most of the native inhabitants who could be got to be examined.

From ten years' records accessible to the author fever is noticed to be most prevalent in the seven months November to May with a maximum in December, and least dominant in the four months June to September with a marked declension in July–August. From eight years' records it appears that the fever season is fairly coincident with the season of precipitation, such rain as there is (the annual extremes being 0·92 inches and 8·06 inches and the mean being about 4·5 inches) usually falling between November and April. Anopheles larvae were observed by the author in every month except July and August, but were most abundant in April, November, and December.

In the section on malaria among the troops the author has some judicious remarks on quinine as a preventive. To begin with sulphate of quinine in solution, in 15 grain doses, was given to all the men of a regiment twice a week, and "this measure was not attended with success."

Subsequently a more exact method was adopted, the aim of which was by continuous and prolonged quinine treatment of all known cases of malaria and of splenic enlargement to extirpate the stock of infection from all human carriers within the military area. Every malarial patient when discharged from hospital, was placed on a malaria register and received 10 gr. of quinine sulphate in solution every day for six months. By this method all old fever cases were kept under observation and control, enlarged spleens were found to become reduced, and a continuous decrease in admissions for fever resulted.

Anti-mosquito measures are discussed but, as only a small portion of the area was under military control, only the Anopheles breeding-grounds in the immediate vicinity of the encampment could be treated. The author remarks on the difficulty and inconvenience of mosquito-nets in tents shared by ten men in such a sultry climate, and found that the more feasible method of excluding mosquitoes was to fit each door of the tent with a double screen of netting.

Various other points are considered with great discernment by the author, and though he himself did not see any cases of blackwater fever there is a short section on that disease based on notes of cases reported by the medical officer in charge of the Muscat Agency Hospital. Here, as elsewhere, it is associated with intense malaria.

The author has evidently made the most of his opportunities for observation not only of the immediate components of the local malaria problem, but also of all those factors—of climate, physiography, etc.—which influence them, and he is to be felicitated on having produced a report which is as scholarly as it is informative.

A. Alcock.

BAUJEAN (R.). **Epidémie de polynévrite palustre simulant le béribéri.** —*Bull. Soc. Path. Exot.* 1916. Oct. Vol. 9. No. 8. pp. 634–647.

An account, with clinical abstracts, of six cases in which all the classical symptoms of beriberi, except anasarca, were found associated with a subfebrile temperature and a heavy infection of malaria parasites of two species. All the patients had been engaged in extremely laborious work as fishermen, and their only food besides fish had been decorticated and often damaged rice.

MM. LAVERAN and KÉRANDEL, who commented on the paper, were disposed to regard the cases not as malarial polyneuritis, but as beriberi complicated with malaria.

A. A.

MESA (Antonio). **Fiebre perniciosa.** [Pernicious Malarial Fever.]—*Rivista Clinica.* Medellin. 1916. Sept. Vol. 1. No. 2. pp. 71–72.

The author attributes an increase of malarial fever in the neighbourhood of the river Medellin (Republic of Colombia) to a diminution in the number of waterfowl, and in one case attributes the immunity of one of two contiguous houses to the ducks kept in it. Pernicious malaria is frequent, especially in children, in whom it commonly takes a convulsive form.

Two cases are noted in children, one of frequent epileptiform attacks, the other of complete amaurosis, both of which were relieved immediately by intravenous administration of quinine.

J. B. Nias.

SALOM (C. E.). **Apreciones clinicas sobre paludismo.** [Clinical Observations on Malaria.]—*Gaceta Med. de Caracas.* 1916. July 15. Vol. 23. No. 13. pp. 99–102.

A paper dealing with the author's own experience of malaria as it occurs on the banks of the Orinoco. In the vicinity of Ciudad Bolivar the yearly prevalence of malaria can be shown to be very closely connected with the rise and fall of the river Orinoco and its tributaries. As these rivers subside, they leave behind large collections of stagnant water, which become the breeding places of mosquitoes, and the season of greatest malarial prevalence therefore lies between the autumnal equinox and the winter solstice, that is between September 22nd and December 22nd. In his remarks upon this subject the author shows himself very clearly to be a partizan of LAVERAN's view as to the unity of the malarial parasite. like many other South American practitioners.

J. B. N.

MCWALTER (J. C.). **Malignant Malaria.**—*Med. Press & Circ.* 1916. Sept. 20. Vol. 102. No. 4037. pp. 270–271.

A general resumé of the author's own experience; nothing very new. As a rough clinical rule the author would say that cases of malaria which are not obviously benefited by quinine are malignant. The author would be loth to part with the belief that quinine cures malaria. He thinks that 45 gr. daily for some time is the limit of safety. As regards intravenous administration, he considers that if quinine will do good it is quite as effective by the mouth.

A. A.

ETIENNE (S.). i. **Reviviscence d'un ancien foyer de paludisme autochtone dans la vallée de la Seille.**—*Bull. Acad. Med.* 1916. Aug. 8. Vol. 76. Year 80. No. 32. pp. 118–120.

ii. **Sur la reviviscence d'anciens foyers paludiques en France.**—*Progrès Méd.* 1916. Oct. 5. No. 19. pp. 183–184. With 3 charts.

i. According to the author the valley of the Seille, with its liability to inundation and its natural difficulties of drainage, had long been regarded as a nidus of malaria—a belief justified by the existence locally of *Anopheles maculipennis.* One medical practitioner in the locality has frequently noticed, particularly since the return of old soldiers from North Africa, a malarial complication in his cases, especially in cases of influenza. In 1907 a case of malarial fever occurred at Nomeny in the valley, and recently six cases (benign tertian, quartan, and malignant tertian) have been observed by the author in soldiers stationed in or near the valley, who had never been in a malarious country. Along with these cases there were also some admissions of old soldiers of the Colonial and African services who had suffered from malarial fever at some anterior time and were now attacked again.

While allowing that the infection may have been imported, the author seems to think it equally probable that it is an indigenous survival.

ii. This paper emphasizes the author's opinion, expressed above, that there exist in France not only potential nurseries of malaria (i.e., marshy or ill-drained tracts harbouring *Anopheles maculipennis*) which may be infected (or reinfected) from re-patriated colonials who have suffered from malarial fever, but also actual foci where malaria has never become extinct but has persisted in a modified or masked form (" larval malaria ").

The author points out the urgency of preventive measures—drainage, extermination of Anopheles—sterilisation of human carriers by means of quinine.

A. A.

MARTYN (G. J. King). **Malaria in Men returned from France.** [Correspondence.]—*Brit. Med. Jl.* 1916. Sept. 30. p. 473.

The writer tells of a case from the Expeditionary Force, which, diagnosed to begin with as influenza, and afterwards sent home as trench fever, was ultimately discovered to be malaria. He also refers to another case, of a wounded man sent home from the Force, where rises of temperature supposed to be due to pent up discharges were at length accounted for by the discovery of malarial parasites in the blood. Altogether he knows of about fifteen cases invalided from the front, in which unsuspected malaria parasites have been revealed by blood examination.

The writer no doubt does well in drawing attention to such cases, and to the possibility that malarial infection might be spread from them to the resident population of these islands. But seeing how, for years and years past, soldiers, sailors, and civilians of all sorts and conditions have been returning home from India, from the tropical colonies, and from other foreign parts, with malaria-parasites in their blood and bones, it is doubtful whether commentators on Dr. King Martyn's cases do so well in magnifying this possible danger and adding it to the distressing realities of the Great War.

A. A.

JEANSELME (E.). **Cas de paludisme autochtone contracté en France au contact des troupes indigènes.**—*Bull. Soc. Path. Exot.* 1916. Nov. Vol. 9. No. 9. pp. 693–694.

Case of a wounded soldier who had lived in Paris until he went on service, first on the Meuse then on the Somme. He was admitted in September into the hospital at Beauvais, and lay in a surgical ward along with wounded men from the Martinique and Annam contingents. Ten to twelve days after admission he had a severe attack of malarial fever which lasted with quatridian intermissions for fifteen days. He was treated with quinine, and after recovery from the fever he still had symptoms of latent malaria and a slightly enlarged spleen. No examination of the blood seems to have been made until after recovery from the acute stage; then the uninuclears were very greatly increased, but parasites were not found. The author draws the obvious moral as to the necessity of isolation, or other preventive measures, in dealing with the wounded from the colonial contingents.

A. A.

McWALTER (J. C.). **Fatal Malaria with Tubercle Bacillus.**—*Med. Press & Circ.* 1916. Oct. 4. Vol. 102. New Ser. No. 4039. p. 321.

It would appear that the author offers this case as an exercise for the dialectician resolute to reconcile the spirit of scientific caution with the letter of the official returns.

A patient was admitted comatose, with strabismus, and a temperature of 104°. He had lost his papers; there was no history; and he died about eight hours afterwards without having recovered consciousness. He was treated with quinine both subcutaneously and rectally, subtertian parasites having been found in the blood.

At the autopsy the spleen was enlarged (22 oz.) and the liver slightly (64 oz.); there were two caseous nodules in the left lung, and also a cavity, the scrapings from which contained tubercle bacilli; the right lung was slightly oedematous and slightly emphysematous; other organs healthy.

The author decides—and upon the facts as presented and for the immediate purpose of the decision his conclusion is quite a reasonable one—that the immediate cause of death was not pulmonary tuberculosis.

A. A.

FERNANDEZ SANZ (E.). **Un caso de encefalopatia paludica.** [A Case of Cerebral Disease due to Malaria.]—*Siglo Med.* 1916. Aug. 12. Vol. 63. No. 3270. pp. 514–517.

The history of a case presenting cerebral symptoms, which were apparently due to malaria.

The patient was a girl, aged 13 years, inhabiting a malarious locality. Four years previously, when she was 9 years of age, she had an attack of malarial fever, which lasted for 15 days. It was noticed, on convalescence, by the parents that the girl spoke indistinctly and with a snuffling tone of voice, and that she stammered and became very tired on walking, but these symptoms were put down to debility. Three years later she was again attacked by a similar illness, and on the ninth day, in the middle of a febrile paroxysm, she was seized with unconsciousness and epileptiform convulsions, on recovery from which it was noticed that the left side of the face was paralyzed, and that there was also a loss of power in the lower extremities. Twelve months later she came under the notice of the author for the first time.

The diagnosis was made of a unilateral haemorrhage in the region of the origin of the hypoglossal and vagus nerves, arising in the course of the first malarial attack, and exacerbated by the second one.

J. B. N.

RATHERY (F.) & LÉVY (F.). **Eruption purpurique généralisée à très larges éléments chez un paludéen.**—*Bull. et Mém. Soc. Méd. des Hôpit. de Paris.* 1916. July 13. 3 ser. Vol. 32.. No. 23-24. pp. 1095–1099. With 2 text-figs.

The eruption is described as involving every part except the head and neck. The spots, which were of a bright red colour and well defined, varied in size from a franc to a five-franc piece; at the gluteal and popliteal folds and the elbow, and also on the scrotum, they were uniformly confluent; they disappeared slowly, with fine desquamation and concurrent itching, and could still be made out as yellowish blotches at the end of several weeks

The eruption was at a climax when the patient was admitted to hospital, with a clinical history of a paroxysm of malarial fever two days before, which lasted four hours and was followed immediately by the rash.

The patient had contracted the malaria about six years before, and he stated that every three or four months since then the eruption had appeared, beginning always on the palms and scrotum, and preceded by acute and even painful itching.

On examination there was enlargement neither of the liver nor of the spleen, neither jaundice nor haematuria ; the heart and lungs appeared to be sound, and the urine was normal, except for some traces of albumin at the time of admission.

During his stay in hospital the patient had one paroxysm of fever, and on that occasion only—which was 32 days after admission—*Plasmodium vivax* was found in the blood.

A. A.

DAVIS (Wm. T.). **Ocular Complications of Malaria and the Toxic Effect of Quinine upon the Eye.**—*Southern Med. Jl.* 1916. Sept. Vol. 9. No. 9. pp. 769–773.

The author surveys, for the benefit of the general practitioner at a distance from special help, the pathological changes in the eye that have been associated, by different observers, with malaria, and also the toxic effects of quinine upon the eye. He quotes a statement of PARSONS that eye complications occur in ten per cent. of cases of malaria, complications that may affect the conjunctiva, cornea, iris, choroid, retina, lens, vitreous, etc.

Most of the observers cited mention keratitis and ulceration of the cornea, optic neuritis, retinal and other haemorrhages and thrombosis, and paralysis of accommodation and of the muscles of the eyeball. One author suspects malaria in rapid cataract occurring in young persons, and another in recurrent paralysis of the third nerve. A formidable list is quoted from Dr. SCHWEINITZ—malarial neuralgia and intermittent ophthalmia, conjunctivitis with sub-conjunctival haemorrhages, herpes of the cornea, corneal ulcer and interstitial keratitis, intermittent amaurosis and blindness, retinal ischaemia, optic neuritis, haemorrhages into retina and vitreous, central scotoma, hemianopsia, night-blindness, spasm of the accommodation, paralysis of the external muscles.

Regarding the toxic effects of quinine the author refers to Dr. SCHWEINITZ's experiments upon dogs, seen in contraction of the retinal vessels, degeneration and atrophy of the optic nerve and tracts, thrombosis, degenerative changes in the ciliary ganglion and changes in the choroid. Among the toxic effects noticed in man are amaurosis, amblyopia, colour-blindness, night-blindness and other impairments of vision. Such effects would only be likely to follow unlimited doses, but temporary amaurosis has occurred after small doses.

A. A.

PAISSEAU (G.) & LEMAIRE (H.). **Surrénalites aiguës dans les accès pernicieux palustres.**—*Bull. Acad. Méd.* 1916. Oct. 17. Vol. 76. Year 80. No. 41. pp. 300–301.

In the course of certain attacks of pernicious malaria the authors have noticed symptoms attributable to some implication of the suprarenal capsules, namely reduced arterial tension without change in the heart-rhythm, vomiting, diarrhoea, lumbar and abdominal pain, asthenia, and the phenomenon of Sergent-Blanchard's white line.

In three autopsies confirmatory lesions in the suprarenal capsules have been observed: in one case of rapidly fatal coma and arterial collapse degenerative changes were found; in a second case—algid, temperature 95·1° Fahr., diminished arterial tension—pronounced cellular degeneration and haemorrhages; in a third case—diminished arterial tension, white line, marked asthenia, vomiting, diarrhoea, lumbar pain—the suprarenal capsules showed arterial thrombi, haemorrhages, and patches of cellular degeneration and even of necrosis. In all three cases there were no sufficient changes in kidney, liver, or spleen to account for death.

The authors conclude that in the treatment of these algid cases of malaria adrenalin should be used in addition to quinine.

A. A.

FORSTER (E.). **Isolierte Musculo-cutaneous Lähmung bei Malaria.** [Musculo Cutaneous Paralysis in Malaria].—*Monatschr. f. Psychiat. u. Neurolog.* 1916. Oct. Vol. 40. No. 4. pp. 262–264. With 1 text-fig.

An abstract and brief chronicle of a case of malaria in a seaman, in which in the course of an attack of benign tertian there occurred pain and weakness in the right upper arm which by careful investigation—electrical and other— was traced to the middle head of the biceps, all the other muscles being normal and sensation being unaffected, the biceps alone failing to contract. The diagnosis of malaria was inferred from the symptoms, and the condition of the spleen, and was established by the discovery of rings and schizonts in the blood. About four months after the onset of the nerve-symptoms, degeneration reaction could still be elicited though the biceps had recovered some power of contraction.

A. A.

WATERS (E. E.). i. **The Value of Quinoidine in Malaria.**—*Indian Med. Gaz.* 1916. Sept. Vol. 51. No. 9. pp. 335–338. With 3 charts.

ii. **Quinoidine and Malaria.** [Correspondence.]—*Ibid.* Nov. No. 11. p. 437.

i. The author criticises the inference of MACGILCHRIST that quinoidine is the least effective of all cinchona products [see this *Bulletin*, Vol. 7, p. 18], on the ground that MACGILCHRIST's experiments, showing that quinoidine was the most lethal of all to guinea-pigs and the least lethal of all to Protozoa, were inadequate. He discounts the opinions adverse to quinoidine expressed by some medical officers in Lower Bengal, on the reasonable ground that they are not based on any rigorous observations or exact experiments.

On the other hand he quotes statistics from the Madras Hospital to the effect that four grains of quinoidine daily, administered in two doses, were sufficient, in a series of 250 cases, to bring down the temperature and to cause the disappearance of malaria parasites from the peripheral blood in 72 hours, or less; and further statistics of 105 cases from the same source showing that quinoidine to the extent of six grains daily gave as good results as either quinine hydrochloride or quinine sulphate to the extent of fifteen grains daily. He also quotes opinions favourable to quinoidine, which apparently were based on blood-examinations and exact observations, from medical officers at Wardha and in Sikkim.

At Howrah 2,618 cases of malarial fever, in all of which the diagnosis was confirmed by microscopic examination of the blood, were treated with quinoidine, with satisfactory results. At Lillooah and Bally in the Howrah district, of six thousand cases two thousand were treated with quinine and four thousand with quinoidine, with the result that quinoidine was proved to be at least as efficacious as quinine.

In the author's experience quinoidine is equally good as a preventive of malarial fever. In a school of 402 boys a six months' course of quinoidine reduced the spleen-index from 33 per cent. at the beginning to 7 per cent. at the end. In another collection of 700 children the spleen-index fell from 14 per cent. to 8 per cent.

A great recommendation of quinoidine is its low price—four rupees (5*s.* 4*d.*) per lb.

In using quinoidine the author considers it important to start with a simple purge.

ii. A note of reference to the paper summarised above. The author recommends daily administration of 12 to 24 gr. quinoidine-picrate in malignant tertian cases.

A. A.

NEFF (Frank C.). **Report of Five Cases of Tertian Malaria Treated with Diarsenol Intravenously.**—*Jl. Amer. Med. Assoc.* 1916. Oct. 7. Vol. 67. No. 15. pp. 1059–1060.

The writer admits that from relatively short observation of but five cases no far-reaching conclusions can be drawn.

The subjects were little girls from 5 to 11 years old who, when admitted, had suffered for nine months or longer, had the spleen much enlarged, and had been treated with quinine; in four cases parasites were found in the blood. The intravenous dosage of diarsenol ranged from 0·1 gm. for a child of 5 years to 0·4 gm. for a third operation in a child of 11 years; the cases were under the treatment for about three weeks, and none received more than three injections during that time.

The results observed were speedy cessation of symptoms, immediate disappearance of parasites from the peripheral blood, marked gain in weight, and considerable reduction in the size of the spleen.

A. A.

MPOTSE (Demetrios). ΜΠΟΤΣΗ (Δημητριου). Ἡ Ἑκτίνη ἐν τῇ θεραπείᾳ τῆς ἑλονοσίας. [Hektine in the Treatment of Malaria.]—„ Ἀρχεῖα Ἰατρικῆς ". (*Arch. de Méd.*). 1916. May 1–20. Vol. 11. No. 13–15. pp. 145–148.

Brief notes of four cases of malaria in young sailors, selected out of a total of 22, in which hectine was employed with very successful results. In the first case it was only given after failure with quinine, the patient being then in a desperate condition, but in the other three cases it was employed from the outset. The temperature generally dropped to normal, permanently, after the first dose. In all the four cases the presence of plasmodia [type not stated] in the blood was verified by microscopic examination.

According to the author, the action of hectine is mainly exercised on the parasites when they are in the schizont stage in the blood, and therefore its employment seems to be chiefly indicated in recent cases of infection.

J. B. N.

ZANGGER (Theodore). **Tepid Baths in the Treatment of Malaria.** [Correspondence.] *Lancet.* 1916. Sept. 16. p. 538.

The writer, practising in an Alpine health resort more than 4.000 feet above sea-level, has there had charge lately of some invalided German prisoners-of-war, fifteen of whom were suffering from periodic attacks of malarial fever. He treated them with tepid baths three times a week and so far as his published record goes - with nothing else.

The writer states that when these fifteen men were prisoners in Algiers, Corsica, and other French hospitals of unspecified locality, and were treated regularly with quinine, they collectively had 107 paroxysms of fever per month. When they were transferred to the Alpine health resort and were, at first, under "intermediate quinine treatment," they still ran up an aggregate of 65 attacks per month. Afterwards, when they were under the tepid bath treatment, the collective number of attacks fell to five per month.

The argument is vague, and the predicates are indefinite, but the writer appears to leave it to be inferred that the improvement in the condition of these fifteen patients estimated collectively is due entirely to tepid baths.

A. A.

MITZMAIN (M. Bruin). **Anopheles Infectivity Experiments. An Attempt to determine the Number of Persons one Mosquito can infect with Malaria.**—*U.S. Public Health Rep.* 1916. Sept. 1. Vol. 31. No. 35. pp. 2325 2335. With 2 plates.

To validate these very important experiments the blood of the volunteers who offered themselves for sacrifice was first properly shown to be free of malaria parasites, and the off-season for malaria was chosen. The insects used were *Anopheles punctipennis* which 10–22 days antecedently had been fed on a patient whose blood was known to contain gametocytes of *Plasmodium vivax.* The simple experiment of allowing single infected mosquitoes to bite each one a succession of individuals during the remainder of its life was not tried, as it was feared that the mosquitoes available were not sufficiently vigorous to justify a long expectation of life.

One mosquito lived 16 days after its infection was presumed to be fully developed, and bit twelve people at intervals during those 16 days. In the first seven instances the persons bitten (who all became infected in due course) were also bitten by another infected mosquito; in the eighth and ninth bitings it had the experimentees all to itself—on the 14th day after its infection was established—and it infected both of them. In the 10th, 11th, and 12th bitings, these being the 15th and 16th days after infection, the experimentees never showed any signs of infection.

Another mosquito lived 12 days after its infection was judged to be developed, and bit eleven people, but in only one instance—this one being on the 6th day after its infection was established and the seventh time of biting—did it have an experimentee all to itself, and in this case the experimentee became infected.

It was demonstrated by eleven experiments that bites of short duration (incomplete feeding) were sufficient to transmit infection.

A. A.

LAWSON (Mary R.). **Distortion of the Malarial Parasite. An Interpretation of *Plasmodium tenue*** (Stephens).—*Jl. Experim. Med.* 1916. Sept. 1. Vol. 24. No. 3. pp. 291–314. With 9 plates.

In the author's own summary it is stated that the form described by STEPHENS as *Plasmodium tenue* is not a new species or even an amoeboid shape, but merely a parasite distorted by incidental manipulation: that such forms are to be found in all malarial infections and at any stage of development, and that they may occur in only one of two cover-slips taken from the same drop of blood, or in definite groups (and sometimes distorted all in one direction) in a film containing parasites of normal appearance.

The argument, of which this is the summary, although it is accompanied by 269 figures, consists very considerably of assumption and asertion, the largest of which is that "all malarial parasites are extracellular throughout their entire life-cycle." Although they are attached to the outer surface by "corpuscular mounds," the parasites may become distorted by manipulation that leaves the corpuscle itself unchanged, and even their pigment may be distorted by treatment that does not otherwise affect the parasite.

In her criticism of other observers the writer seems hardly to realize that most experienced workers in the fields of exact science understand the necessity of allowing for probable errors of observation, manipulation, etc., before formulating their generalizations and, further, that if the postulate of the fallibility of poor human methods be arbitrarily or partially applied all studies, protozoology included, become mere stumbling in dark Cimmerian desert.

A. A.

SWELLENGREBEL (N. H.). **Over de zoogenaamde "Intraglobulaire conjugatie" van den Tropicaparasiet** (*Laverania malariae*). [On the So-called "Intraglobular Conjugation" of the Parasite of Tropical Malaria].—*Nederl. Tijdschr. v. Geneeskunde.* 1916. No. 11. pp. 914–923. With 68 text figs.

A paper discussing the mode of re-infection in pernicious or aestivo-autumnal malaria fever, especially with regard to the occurrence of a syzygy or conjugation of the plasmodia within the red cells, as postulated by CRAIG and others. As the letter press of this memoir is mainly in the nature of a comment on the appearances shown in the 68 drawings, and is also full of references to the conclusions of other writers whose papers are not to hand, it is not very easy to make an abstract of it. The specialist may therefore with advantage be referred to the original.

J. B. N.

MARCANDIER (André). **La résistance globulaire dans quelques cas de paludisme, de fièvre bilieuse hémoglobinurique et de maladie du sommeil.**—*Bull. Soc. Path. Exot.* 1916. Oct. Vol. 9. No. 8. pp. 647-665.

The object of these researches was to determine whether in malarial patients the resistance of separated red-blood cells to the solvent action of saline solutions so varied during the course of the disease that the onset of haemoglobinuria could be foreseen ; and, further, whether their resistance always became normal immediately after the haemoglobinuric attack, or might be so altered that a relapse could be predicted.

As regards the first inquiry, in only one out of thirteen observations — that one being a heavy infection in full swing —was there a slight diminution of resistance, and in this instance there was no haemoglobinuria ; in the other twelve observations the resistance, as determined by comparison with controls, was normal.

As regards the second inquiry, in two out of five observations the resistance at the decline of an attack of haemoglobinuria was slightly diminished, and the author's conclusion is that the resistance returns to normal after an attack, leaving no evidence from which predictions can be made.

The result of the inquiry in the case of sleeping sickness is given elsewhere.

A. A.

MACDONALD (Angus). **The Position of Malaria in Sanitary Administration.** -*Trans. Soc. Trop. Med. & Hyg.* 1916. Nov. Vol. 10. No. 1. pp. 1-15. With 12 plates comprising 12 figs.

This, so far as malaria is concerned, is a zealous plea for committing the responsibility for prevention entirely to the Medical Officer of Health, who would maintain a routine system of domiciliary inspection legally reinforced, would personally direct and supervise all measures for the control of Anopheles mosquitoes by the limitation, suppression, etc. of their breeding places, and would attend to the education of the proletariate both by public lectures and by individual conversation. It would also be the business of the M. O. H. to scrutinize the death reports and to call for returns of all cases of malaria treated in public institutions, so as to follow up every case of malaria with appropriate sanitary vigilance as in the case of notifiable infectious diseases. The author lays great stress on the sustained control of the temporary breeding-places of Anopheles in the vicinity of dwellings: he is emphatic in his opinion that the sanitary administration has no use for quinine, which should be left entirely to the physician.

A. A.

BARBIERI (Antonio). **La campaña antipalúdica durante el año 1914 en la República Argentina.** [The Antimalarial Campaign in the Argentine Republic in 1914.]—*Malariologia.* 1916. Oct. 31. Ser. 2. Year 2. No. 5. pp. 124-132.

The economical troubles arising out of the European war have compelled the authorities in the Argentine Republic to restrict the scope of the anti-malarial campaign initiated by the Government, very materially. It has been necessary to reduce both the amount of money voted for the purpose and the personnel employed, and for the same reason it has been impossible to set on foot any hydraulic or engineering works. Quinine, however, has been freely distributed in selected malarious localities, both for preventive and for curative purposes, the quantity used being slightly over one million grammes, of which 945,876 were used in treatment, and 87,047 for prophylaxis. The number of patients treated amounted to 175,875, of whom 25,384 were first infections, and 150,491 relapses or chronic cases. The cases included 109,309 of tertian, 18,368 of quartan, 2,368 of aestivo-autumnal fever, and 45,820 mixed infections. The districts selected for the campaign were chosen according to the rate of splenic index in children, and by blood examinations, the population of the affected zones being calculated at about one million of inhabitants, of whom 50 per cent. may be taken as affected with malaria.

J. B. N.

KOLTES (F. X.). **Prevention of Malaria in the Field.**—*U.S. Nav. Med. Bull.* 1916. Oct. Vol. 10. No. 4. pp. 640-642.

The writer being ordered to combat an outbreak of malaria in a naval outpost, found that mosquito-nets either were being improperly adjusted, or were torn or not used at all, and also that the preventive use of quinine had been relaxed. Rational instruction was imparted to the men, the regulations regarding mosquito-nets and the daily ration of quinine were strictly enforced, and a campaign against mosquitoes was started, with the result that at the end of two weeks new cases had "practically ceased."

The writer is confident in quinine as a preventive in the field, where the full military strength must be maintained.

A. A.

GRANADA (S. H.). **Ervaringen met prophylactische Chinineverstrekking.** [Experiences with Prophylactic Quinine Distribution.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1916. Vol. 56. No. 4. pp. 516-523.

In this paper the author details his experiences with prophylactic distribution of quinine in a particularly malarious region in the Malay Straits (Tandjong Pinang, Riou Archipelago). His conclusion is that prophylactic treatment with quinine, while of benefit as regards tertian and quartan ague, is of comparatively little efficacy as regards subtertian. In the station where the experiments were made, the proportion of cases of subtertian to tertian and quartan combined was approximately as two to one for soldiers, and not much less for their wives and children, and for civilians. The quinine was administered twice a week (Wednesday and Saturday) in tablets in doses of 0·4 gm., which was afterwards increased to 0·6 and 0·8 gm. for adults, and proportionately less for children. The tabulated results for each class show a relatively greater reduction in tertian and quartan than in subtertian, but the data are insufficient.

J. B. N.

ROSS (E. Halford); HALL (G. C.); WHITFIELD (Arthur). **Quinine Parades.** [Correspondence.]—*Lancet.* 1916. Sept. 9 & 16. pp. 495 & 538.

From the premise that quinine will not prevent malaria Dr. Halford Ross shifts to the conclusion that the regular issue of quinine to the troops at Salonica, with the object of protecting a field force from malarial fever, is useless. Shifting the ground still further, he protests against State attempts to check tuberculosis and syphilis by uniform remedial treatment of individual sufferers from those diseases.

Lt.-Colonel G. C. Hall endorses the opinion of Dr. Ross as to the uselessness of quinine in malaria.

Dr. Whitfield points out that Dr. Ross has "exhibited some mental confusion" in comparing syphilis and malaria from a preventive standpoint, and very reasonably remarks that to attempt to prevent syphilis by other means than curative treatment of the infected individual would cause a good deal of surprise.

A. A.

CIAMPOLINI (Arnolfo). **L'infezione malarica e la "causa violenta" (art. 7 della Legge infortunii).** [Malarial Infection and Trade Risk (Article 7 of the Employers' Liability Act).]—*Riv. Crit. di Clin. Med.* 1916. Sept. 23 & 30. Vol. 17. Nos. 39 & 40. pp. 499-501 & 509-513.

In this paper the author, who is a medical officer of the Italian State Railways, discusses the question whether, under the Italian laws of compensation for accidents, infection by malaria, contracted in the course of duty by a railway employé, does not stand on the same footing as infection by anthrax or glanders in other employments, so as to entitle the sufferer to compensation. The question is one of some practical importance in a country like Italy, where healthy railway employés may be sent, in the course of duty, to malarious sections on the line, and there contract fever. He cites three instances of the kind, within his own knowledge.

J. B. N.

PARROT (Louis). **Le traitement du paludisme en Algérie au commencement de 18e siècle d'après Abderrezzaq-ed-Djezaïri.**—*Malariologia.* 1916. Aug. 31. Vol. 9. No. 4. (Ser. 1). pp. 97–100.

Some extracts from a work entitled "Kachef er remouz" by Abderrezaq Ed Djezairi, translated as "Revelation des Enigmes," by L. LECLERC (Baillière et Leroux, Paris, 1874). The book is said to have been written a little before the year 1717. It is stated here to be a sort of Materia Medica arranged alphabetically, and, as regards its character, a singular medley of close observations, wise saws, superstitions, and quackery.

A. A.

CHRISTOPHERS (S. R.). **A Revision of the Nomenclature of Indian Anopheles.**—*Indian Jl. Med. Res.* 1916. Jan. Vol. 3. No. 3. pp. 454–488.

This is a valuable paper. Far from being, as its name unfortunately implies, solely concerned with the weary and contentious subject of nomenclature, it is full of facts, which are concisely stated and well arranged.

For every Indian species, so far as its history is known, the author records the range and distribution, the habits and breeding-places, and the evidence (if there be any) of its relation to malaria. Such facts, collated and confirmed by an author of such competence, are of permanent value to the world.

The following species are here recorded among the natural carriers :— *A. culicifacies* Giles, *A. fuliginosus* Giles, *A. funestus* var. *listoni* Liston, *A. ludlowii* Theobald, *A. maculatus* Theobald, *A. maculipalpis* Giles, *A. minimus* Theobald, *A. stephensii* Liston, *A. willmorii* James.

The following species are recorded as open to experimental infections : *A. theobaldi* Giles, *A. turkhudi* Liston.

As regards the following species the evidence is conflicting: *A. barbirostris* Van der Wulp, *A. rossi* Giles, *A. sinensis* Wiedemann.

A. A.

CHRISTOPHERS (S. R.). **An Indian Tree Hole Breeding Anopheles.** *A. barianensis*, **James** = *A.* (*Coelodiazesis*) *plumbeus*, **Halliday.**—*Indian Jl. Med. Res.* 1916. Jan. Vol. 3. No. 3. pp. 489–496. With 1 plate.

The egg, the larva, the pupa, and the adult of this species, which seems to breed exclusively in holes in trees, are described, the first two states being also figured. The water in the holes where the larvae were found was as dark as tea or coffee. Adults were frequently found resting during the day in hollow trees. The author identifies the species as *Anopheles plumbeus* Halliday, and includes in its synonymy *A. nigripes* Staeger, *A. barianensis* James, and questionably *A. barberi* Coquillet. In India the species seems to be restricted to the Western Himalayas, an area which is on the very border of the Palaearctic Region.

A. A.

SCHUEFFNER (W.) & van der HEYDEN (H. N.). **De anophelinen in Nederlandsch-Indië.**—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1916. Vol. 56. No. 4. pp. 381–396. With 6 figs.

After some discussion of nomenclature and some re-descriptions of species the author gives a key for the determination of 15 species of Anopheles found in Netherlands India, and in a postscript mentions *Anopheles gigas* Giles as a sixteenth species occurring in that political area of the Oriental Region.

A. A.

CORRECTION.

In No. 6 (October 30th) of Vol. 8 of this *Bulletin*, at page 354, in a notice of a paper by W. V. KING on the development of malaria parasites in American species of Anopheles, which was published in the *Journal of Experimental Medicine* for June, 1916, it is incorrectly stated that the malarial susceptibility of *Anopheles crucians* is for the first time actually demonstrated by the experiments recorded in that paper.

As a matter of fact the susceptibility of *Anopheles crucians* to infection with *Plasmodium falciparum* was demonstrated as long ago as 1902 by Professor BEYER and his colleagues, and the susceptibility of this species to infection with *Plasmodium vivax* was demonstrated by M. Bruin MITZMAIN in March 1916 as indeed has already been appreciated in this *Bulletin* [Vol. 8, p. 40] in a notice of a paper by the last-named author which was published in the *U.S. Public Health Reports*, Vol. 31, No. 19, May 12th, 1916.

A. A.

BLACKWATER FEVER.

OTT (William O.). **Hemoglobinuric Fever treated by Infusions containing Quinin.**—*Jl. Amer. Med. Assoc.* 1916. Sept. 16. Vol. 67. No. 12. pp. 872–874. With 1 chart.

The patient, a white man, age 35, had lived in a malarious district for six months prior to admission and had endured several attacks of malarial fever, for which at times he had taken large amounts of quinine. On admission to hospital his temperature was 103° F., the urine was scanty and almost coffee-coloured, he was deeply jaundiced and vomited a yellowish fluid at intervals, his spleen was enlarged, and there was tenderness all over the upper part of the abdomen. No parasites were detected in the blood then or subsequently. Quinine was given by the mouth but was not retained. The general condition became worse, and the urine darker. The day after admission he received three intravenous injections of 10 grains of bihydrochloride of quinine in 300 cc. of saline solution; the day following, two such injections; and the next day, one. On the fourth day the urine was free and quite clear, the jaundice had almost disappeared, the spleen was considerably reduced, and quinine given by the mouth was retained.

In his very full comment on the case the author, while justifying the use of quinine, appreciates the value of saline infusions *per se.*

A. A.

NALINI NATH SEN GUPTA. **Interesting Cases from the Medical Wards of the Medical College Hospital, Calcutta.**—*Indian Med. Gaz.* 1916. Nov. Vol. 51. No. 11. pp. 416–420. [Case III. A Case of Blackwater Fever, illustrating the Effect of Quinine and a New Method of Treatment. With Comments by Major D. McCAY, I.M.S. pp. 417-420.]

Case of a Chinaman, 45, admitted for malarial fever and jaundice; on admission there was increased cardiac dulness, slight enlargement of liver and spleen, much albumin in the urine, which reacted for haemoglobin but contained no red cells. No malaria parasites were found, and the urine cleared up in two days.

The case was diagnosed as blackwater fever, and was treated with quinine bihydrochloride, 5 gr. thrice a day.

After six days treatment there was a serious relapse of haemoglobinuric fever, the urine being almost the colour of porter. Two pints of hypertonic saline (1·2 per cent.) to which 0·03 per cent. of calcium chloride had been added were injected intravenously, the patient "probably beginning to improve" before its administration. Within a few hours the urine cleared, and the patient rapidly improved, and after a three weeks' course of tonics and calcium he was discharged "practically all right."

In an ingenious argument the commenting author suggests that the malaria parasites can produce a haemolysin, and that this haemolysin may remain active and ready to take advantage of favouring conditions of the plasma (the advent of a suitable complement) after the parasites themselves have disappeared. He suggests further that, assuming the persistence of the haemolysin, and assuming the co-existence of a certain but insufficient amount of the complement, the administration of quinine may be the spark that causes the haemoglobinuric explosion. The possibility of the opposition of a specific anti-haemolysin is admitted, but is discounted by an assumption that the anti-haemolysin may be weak or unstable, or that it may be formed only in the very act of haemolysis.

In this particular case in administering the hypertonic saline the ntention was to counteract the swelling of the red blood cells that occurs in haemolysis, since the hypertonic solution is known to cause their contraction, and the calcium chloride was added since it has been observed experimentally, even in the minutest quantities, to prevent haemolysis.

A. A.

PLAGUE.

Geneeskundig Tijdschrift voor Nederlandsch-Indië. (Bijblad van het). Deel 55. No. 3. 1916. 24 pp. With 2 charts.—**Dienst der Pestbestrijding. Verslag over het derde kwartaal 1915.** [Report of the Plague Eradication Service for the Third Quarter of 1915.]

As in previous communications of a similar nature, this report is divided into four parts:—(1) Management and personnel; (2) Investigation and clinical service; (3) Disinfection service; and (4) House service.

The following Table shows the case-incidence of plague in the various districts of Java for the third quarter of 1915, comparison being made with the corresponding quarter of the four preceding years. The figures in parentheses refer to cases of pneumonic plague:—

District.	1911.	1912.	1913.	1914.	1915.
Malang	394 (12)	424 (5)	2018 (2)	2252 (142)	74 (11)
Bangil	—	—	22	2	1
Kediri	30	102	1103	1687	332 (20)
Toeloeng-Agoeng	—	5	147	157	11 (1)
Berbek	—	—	72	27	6
Blitar	—	—	2	—	4
Soerabaja ..	3	—	93	308 (1)	41
Lamongan ..	—	—	6	13 (1)	2
Sidoarjo ..	—	—	—	5	5
Modjokerto ..	—	—	—	3	4
Djombang ..	—	—	—	—	7
Madioen ..	14	15	144	262	3
Magetan ..	—	—	337	263	
Ngawi	—	—	7	1	—
Ponorogo ..	—	—	—	2	—
Pamekasan ..	—	—	—	6	—
Bangkalan ..	—	—	29 (2)	14	—
Soerakarta ..	—	—	—	1	150 (5)
Totals ..	441 (12)	546 (5)	3980 (4)	5003 (144)	630 (37)

Thus for the quarter there were 4,373 less cases than in the corresponding quarter of 1914 and 3,350 cases less than the similar quarter of 1913. On the other hand, the number of pneumonic cases was absolutely greater than in 1913 and relatively greater than in 1914.

The number of rats brought in for examination was small. Out of 87 "go-downs" 376 rats were trapped and were all negative for pest, on examination. The flea-indices of the house rats and on *Mus Norwegicus* were very high—5·4 and 5 respectively. This high flea-index would either point to a "secondary concentration" due to abnormal rat mortality or to unusual conditions obtaining in the locality in which the rats were trapped.

R. St. John Brooks.

KERMORGANT. **Epidémie de peste qui a sévi à Dakar et au Sénégal d'avril 1914 à février 1915.**—*Bull. Acad. Méd.* 1916. Aug. 22. Vol. 76. Year 80. No. 33. pp. 126–133.

Plague was introduced into the port of Dakar, Senegal, in the month of April, 1914, and from there extended, by means of secondary foci, throughout the colony and to the neighbouring islands of Cape Verde. The disease was introduced from either Bahia, Brazil, or more probably from Casablanca, infection being carried on board the steamer "Mingrélie," which arrived from Morocco on the 6th April. The epidemic in Dakar lasted nine months—from the 15th April 1914 to the 15th January 1915. Out of a population of some 20,000 persons the malady accounted for 1,425 deaths (without counting concealed cases), showing a minimum mortality of 54 per 1,000.

Amongst the European population there were seven cases with three deaths. During the period under consideration, probably about 8,000 deaths from plague took place in the entire colony. The cases were of the pneumonic, septicaemic or bubonic variety, but the early infections were all pneumonic and were unassociated with a murine epizootic.

Energetic measures for the suppression of the disease were carried out, in spite of great opposition from the Mussulman population. The native portion of the town was evacuated and subsequently destroyed; 3,000 inhabitants were transferred, with their baggage, to an isolation camp. In the infected centres in the interior of the colony, isolation camps were constructed both for the sick and for suspected contacts. After a period of 12 days, the sick or suspects, after having submitted to two inoculations with Haffkine's prophylactic, were removed to a specially prepared village. The routine prophylactic doses employed were 1 cc., ·25 cc. and ·5 cc. at intervals of five days. The sites of abandoned villages, isolation camps and cemeteries, after having been sterilised with burning grass and brushwood, were surrounded with tree trunks and thorn-wood and the natives were formally forbidden to erect habitations on or cultivate the soil of such enclosures. These measures proved to be most effective.

R. St. J. B.

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di MATTEI (Eugenio). **Il reperto batteriologico delle secrezioni catarrali delle vie respiratorie, nelle varie specie di peste cutanea.** [Bacteriological Examination of Catarrhal Secretions of the Respiratory Passages in Different Kinds of Cutaneous Plague.]—*Malaria e Malat. d. Paesi Caldi.* 1916. July–Aug. Vol. 7. No. 4. pp. 225–229.

The author divides "cutaneous plague" into three classes:—(*a*) primary carbuncle, (*b*) bubonic plague, and (*c*) septicaemic plague. As the result of his observations during the plague epidemic in Catania during the autumn of 1914, he has arrived at the conclusion that in nearly all cases of "cutaneous" plague, pathological changes take place in the respiratory tract, varying from the lightest form of simple catarrh to grave forms of congestion and specific broncho-pneumonia. This correlation is much commoner than is generally supposed; slight pulmonary symptoms may be overlooked by the clinician, while on the other hand, when the symptoms are well marked, the observer may be impressed in favour of a diagnosis of primary pneumonic plague.

It would appear that in the cases examined bacteriologically, plague bacilli were demonstrated in the sputum, even in cases where there were no definite signs of pulmonary localization. In bubonic cases, a respiratory affection may accompany or even precede the appearance of the bubo and the bronchial secretion may afford good evidence for bacteriological diagnosis before the bacilli can be demonstrated in the bubo exudate. Without detracting in any way from the value of the bacteriological examination of the bubo, the early examination of the sputum, in cases of bubonic plague, might often lead to an earlier diagnosis.

R. St. J. B.

KURIAZIDES (K. N.). ΚΥΡΙΑΖΙΔΟΥ (Κ. Ν.). *Περὶ τῆς ἐν Σύρῳ πνευμονικης πανώλους.* [On the Outbreak of Pneumonic Plague in Syros.]—„Ἀρχεῖα Ἰατρικῆς“. (*Arch. de Méd.*) 1916. Feb. 1–20. Vol. 11. No. 4–6. pp. 49–55. With 3 text-figs.

A report on a small outbreak of what was suspected to be plague pneumonia in the town of Syros. The first case occurred in a man employed in a granary in which corn from the Piraeus was stored, at which place there were at that date (August, 1914) suspicions of plague. Corpses of rats had been seen near the door of the building, before which ran one of the sewers of the town. The man died. His case was followed by nine others, all of which proved fatal. Bacilli of plague-like aspect were isolated from the sputa, and from the lungs of two of the cases, along with numerous ordinary pneumococci, but cultures could only be obtained with the latter. By the isolation of all contacts and the usual measures of disinfection the epidemic was terminated. No infection with plague could be demonstrated in a number of captured rats.

J. B. N.

WILLIAMS (C. L.). **Diagnosis of Plague in Rats. The Advisability of making Routine Microscopic Examinations of Rats, Supplementary to the Macroscopic Examination.**—*U.S. Public Health Rep.* 1916. Aug. 18. Vol. 31. No. 33. pp. 2199–2205.

The diagnosis of rat plague by the macroscopic method is probably superior to the microscopic method if either is to be used singly, but it appears nevertheless true that complete reliance cannot be placed on an investigation of the gross pathological changes met with in plague infection. By the routine examination of smears from the liver and spleen, used as a cross-check to macroscopic examination, a materially important number of plague infected rats may be discovered that would otherwise pass undetected. During the period October 25th, 1915 to March 15th, 1916, routine examinations of spleen and liver smears were made from all rats examined in New Orleans, as a supplement to macroscopic examination; the microscopic work being performed by a worker unconnected with the routine macroscopic examination. 28,570 rats were examined, and of the 20 plague-infected rats found, 13 were diagnosed by the gross lesions and the remaining 7, or 35 per cent. by the microscopic examination alone. These seven rats presented no abnormality discernable to the naked eye. The diagnoses were subsequently confirmed by animal inoculation tests.

" During the early part of an anti-plague campaign—that is, from its inception until the number of plague-infected rats distinctly decreases—the macrosocopic examination alone is probably sufficient.

" It is probable that during the height of an epizootic the vast majority of infected rats show well-marked signs, while toward the end of the epizootic, and particularly when eradicative measures have been employed, the relative and, indeed, the absolute number of infected rats showing slight signs or none, distinctly increases. This belief is based partly on the experiments of the English Plague Commission and partly on our observation in New Orleans, where the percentage of infected rats showing slight or indistinct signs markedly and progressively increased as the epizootic declined.

" It is apparent, therefore, that routine smear examination assumes its greatest importance when the epizootic is on the wane. for when infection is prevalent and widespread the missing of a few infected rats is not of the same importance as when at a later date foci have become few and isolated."

R. St. J. B.

SHORT (A. Rendle). **Three Cases of Bubonic Plague arising in England.** —*Brit. Med. Jl.* 1916. Sept. 2. p. 327.

Two certain cases, and one probable case of bubonic plague have been treated recently at the Bristol Royal Infirmary, between the 30th July and the 5th August, 1916. The first and the last cases were confirmed in diagnosis by bacteriological methods. Two of the patients and the father of the third worked in a rag factory, full of fleas and rats, in a poor part of the city. Plague bacilli were demonstrated in a rat found dead in the factory.

The opinion is expressed that infection may have arisen in one of three ways:—(*a*) infection from the rags, or (*b*) infection caused by rats escaping from infected ships entering the port, or (*c*) deliberate inoculation of city rats by an enemy. If this last theory be correct, it is probable that other towns may have a visitation of rat plague with human cases following.

R. St. J. B.

RAMA IYER (S.). **Tincture of Iodine and Plague.**—*Indian Med. Gaz* 1916. Oct. Vol. 51. No. 10. p. 371.

Intravenous administration of Tincture of Iodine has been already recommended by CONNOR in treatment of bubonic plague. RAMA IYER, working on similar lines, reports five recoveries in six cases treated by this method. His mode of treatment is as follows:—7 to 10 minims of Tinct. iod. are injected intravenously, twice on the first day, and one or two minims less on the second day. Thereafter five to seven minims are employed daily, until the temperature falls to normal and remains so. During convalescence, one and a half minims of the tincture with half an ounce of chloroform water is given four times a day for a week. During treatment the buboes should be painted with the tincture four or five times a day. Within 24 hours after the intravenous injection of iodine, the temperature either falls to normal or falls two or three degrees without going up again. The patient gets a sense of comfort and his mind becomes clear. Even in those cases where the temperature does not fall to normal within 24 hours of the first injection, this fall may be obtained within three or four days. The earlier the case, the better the result. The drug acts as a good diuretic and no untoward symptoms are noticed. The bubo either becomes softened or completely subsides.

R. St. J. B.

Jackson (R. W. H.). **Administrative Control of Plague.**—*Jl. State Med.* 1916. Sept. Vol. 24. No. 9. pp. 277–284.

In this paper is given a brief account of the etiology of plague, clinical symptoms and methods of plague prophylaxis. With regard to the destruction of fleas in human habitations, the author is of opinion that this can be best effected by thoroughly washing the floors and walls with crude oil emulsion. The emulsion recommended is prepared according to the formula of Captain Burke, R.A.M.C., in the *Journal of the Royal Army Medical Corps*, as follows :—

> " 'The emulsion consists of crude oil 80 per cent. with 20 per cent. whale oil soap. It is a jelly mixing freely with water, and is commonly used in 3 per cent. solution. In 10 per cent. it destroys fleas in any form with perfect certainty. A room thoroughly washed with such an emulsion is freed from all insect life, and the emulsion can be applied with perfect safety, with no risk of fire, with great cheapness, and can afterwards be washed out of the floor with water. With one gallon of the solution a room 12 by 12 could be thoroughly treated in five minutes.' "

R. St. J. B.

Bonne (C.). **Pestbestrijding in New-Orleans.** [Plague-Combat in New-Orleans.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1916. Vol. 56. No. 3. pp. 320–336.

This is a short account of the methods employed by the United States Sanitary Service in combating the spread of plague. It includes a description of the well-known methods of rat-proofing, etc., employed, and gives extracts from the New Orleans City Ordinances anent the various sanitary measures enacted in relation thereto. It is mentioned that in districts where intensive trapping is employed, the number of mice caught, in proportion to rats, steadily increases, and that the numbers of *Mus alexandrinus* increase at the expense of *Mus norwegicus*, the normal balance between the weaker and the stronger species being artificially upset.

R. St. J. B.

Singer (Dorothea Waley). **Some Plague Tractates. (Fourteenth and Fifteenth Centuries).**—*Proc. R. Soc. Med.* 1916. June. Vol. 9. No. 8. (Sect. of Hist. of Med.). pp. 159–214. With 2 figs.

The two centuries which followed the Black Death in 1348 were prolific in literature on the subject of plague. The writings, for the most part, took the form of short tractates, a few folios in length, giving directions to the physician or the populace as to their conduct in the time of plague, and advice for the treatment of the plague-infected. Most of the tractates contained also a certain amount of theoretical material on the nature and origin of the outbreaks.

In compiling the present communication, the author has taken her material from some 100 MS. tracts, supplemented by printed material, and especially by the valuable collection of tractates gathered by Professor SUDHOFF. Perhaps the most famous tractate of all is that ascribed to John of Burgundy or John à la Barbe, "a citizen of Liége and a professor of the art of medicine." This John of Burgundy has also been fairly established as the author of the "travels of Sir John Mandevill."

The tractate in question bears the date 1365 and covers a wide ground from astrology to phlebotomy. Under the section on prophylaxis one reads that a "simple temperate life is recommended. Luxury and, above all, baths are forbidden, lest the pores of the skin be opened and an entry thus afforded to the pestilential air."

Under diet, fruit is interdicted, except the acid variety. Honey is to be avoided, while aromatic wine, white wine and, above all, vinegar must be drunk. Disinfection should be carried out by means of fires of juniper branches, or better still, a powder, for which recipe is given, should be scattered on live coals as a deodorizer, and the resulting smoke inhaled through mouth and nostrils. A "pomum ambre," i.e., a mass of aromatic drugs made up with resin or amber, should be carried in the hand, while of herbal remedies, diptaine, scabious, tormentil, pimpernel, roses and violets are highly recommended. The pathological theory of plague held at this period was quaint and entertaining and is described by the author in the following words:—

> "The evil vapours having entered the pores are conveyed by the blood to one of the three principal members—the heart, the liver, or the brain. Now it must be known that each of these principal members has an emunctory or place at which it seeks to expel its noxious superfluities. Thus, when the heart is attacked, we may be sure that the poison will fly to the emunctory of the heart, which is in the arm-pit. But if it find no outlet there, it is driven to seek the liver, which again sends it on to its own emunctory at the groin. If thwarted there, the poison will next seek the brain, whence it will be driven either under the ears or to the throat. If still no relief is brought by the blood-letter, the case has indeed become urgent, for the poison, having taken twelve hours to perform its circulation and sought an issue in vain, will now within the next twelve hours indubitably "fasten itself," throwing the patient into an ague and forming an apostume at or near one of the emunctories; and then indeed the evil will be hard to eradicate."

R. St. J. B.

MISCELLANEOUS.

SCOTT (H. Harold). **On the 'Vomiting Sickness' of Jamaica.**—*Ann. Trop. Med. & Parasit.* 1916. Apr. 29. Vol. 10. No. 1. pp. 1–78. With 2 plates.

This is a complete account of the vomiting sickness of Jamaica both from the historical side and as containing the author's observations and experiments. It covers the reports summarised in this *Bulletin* [Vol. 6, p. 426 and Vol. 7, p. 381]. An interesting addition is the discovery that Mr. J. J. BOWRY (a chemist) in 1886 investigated the nature of ackee poison. Quotations are made from his notes and a table of eight cases of poisoning is given, two-thirds of which were in children.

Several pages of tables are appended and coloured plates of the visceral lesions in animals fed on unsound ackees, in human cases of ackee poisoning, and in cases of vomiting sickness.

A. G. B.

CHALMERS (A. J.) & O'FARRELL (W. R.). **Preliminary Remarks upon Epidemic Cerebrospinal Meningitis as seen in the Anglo-Egyptian Sudan.**—*Jl. Trop. Med. & Hyg.* 1916. May 1 & 10. Vol. 19. Nos. 9 & 10. pp. 101–116 & 117–127. With 2 plates.

This paper is stated by the authors to contain " a few preliminary and tentative remarks," the outcome of three years' experience of the disease in the Anglo-Egyptian Sudan. But needless to say those parts of the subject which are dealt with are treated in the full and learned manner which one has come to expect in papers from the Wellcome Tropical Research Laboratories. Only a few points can be touched on here. The first record of cerebro-spinal meningitis in the tropics or sub-tropics appears to be the epidemic at Algiers in 1840–47. Other records are from Smyrna, Persia, Fiji, West Coast of Africa (Northern Nigeria, Northern Territory of Gold Coast, Northern Togoland), British East Africa, India, Ceylon, Jamaica, South America, and Mexico. The history of the causal organism is treated in some detail. The experience of the authors leads them to believe that apart from Weichselbaum's meningococcus, found by them in hundreds of cases, a residum of cases must be attributed to *Diplococcus crassus* von Lingelsheim 1906, which they have found in cerebrospinal fluid from a patient, as well as in the nasopharynx of two contacts with the disease. They give reasons for believing that Weichselbaum's organism is the " true causal agent."

Cerebro-spinal meningitis has been present in the Sudan " as long as living man can remember " ; the earliest definite record is in 1899 (BALFOUR). The cases greatly increased in numbers in 1913–14–15. They divide their consideration of the germs associated with the disease into (1) the Gram-negative coccus, (2) the Gram-negative-Gram-positive coccus, the first being found in more than 99 per cent. of the cases. The characters of the Gram-negative coccus are then considered in detail, with biological and cultural characters and biochemical reactions. They have no hesitation in saying that the strains of (1) isolated " belong to that group of which the type is the organism named *Diplococcus intracellularis,* Weichselbaum, 1887." The serum reactions are gone into and the pathogenicity as regards both animals and man. They have found no evidence of a filterable virus. With regard to carriers they examined 847 British troops stationed at Khartoum; the organisms were found in the nasopharynx of 86, or 10·1 per cent. No actual cases had occurred among these troops. They have recovered the organism from the peripheral blood of early cases.

The classification by WINSLOW and ROGERS of the Streptococceae is given and it is concluded that Weichselbaum's organism should be attributed to the genus *Neisseria,* Trevisan, 1885; the meningococcus and gonococcus are thus separated from the diplococci. Diagnostic Tables of the family *Coccaceae* Zopf and of the genus *Neisseria* are given.

This brings them to the consideration of the Gram-negative-Gram-positive coccus. They satisfied themselves that they were not dealing with a double infection; both forms exist in one and the same chain. This is considered in the same way as is *Neisseria intracellularis.* It appears to the authors to be " a half-way house between a true Streptococcus and a true Neisseria." The name *Diplococcus crassus,* however, is left.

They then return to the meningococcus and discuss the pathology and the bacteriological diagnosis, with regard to which they quote a circular sent round by the heads of the military and civil medical departments. The only diagnostic difficulties met with have been the differentiation from the meningitic form of pernicious malaria and from tetanus. For the diagnosis of carriers MARSHALL'S modification of BUCHANAN'S medium has been used.

Bacteriological treatment comes next, vaccines and serum therapy being discussed. A polyvalent vaccine, prepared by the authors, has given good results, which were tested by the study of the opsonic index in both blood and cerebrospinal fluid. With vaccines are combined systematic removal of fluid by lumbar puncture, good food and nursing, and hygienic conditions. In the case of eight carriers vaccination appeared to give good results in clearing them of meningococci.

The authors' conclusions are as follows:—

"(1) The important causal agent is *Neisseria intracellularis* (Weichselbaum 1887), and only on one occasion have we found *Diplococcus crassus* von Lingelsheim 1906, acting in this capacity, and so far no other organism.

"(2) As far as our researches have gone only *man* has been found to be the host of *Neisseria intracellularis,* and he acts in this capacity as *the true carrier* of the germ, and as such does not acquire the disease because of an *immunity* conferred by auto-vaccination.

"(3) In order to acquire the disease two factors at least are required, viz:—

"(*a*) Infection with *Neisseria intracellularis.*

"(*b*) *Lack of* capability on the part of the body to produce the necessary *immunity.*

"The infection takes place from the nose of a carrier or a case to the nose of an uninfected person, and is favoured by overcrowding and bad ventilation. The lack of power to produce the necessary immunity is favoured by poor and insufficient food, bad hygienic conditions, and over-exertion.

"(4) In susceptible persons the germ passes into the mucous membrane of the nose and of its connected cells, and multiplies therein, and then entering the blood-stream forms in the early days of the disease a bacteriaemia. Normally, however, it does not long remain in the blood-stream and therefore normally does not produce a septicaemia, which when present should be considered as a complication. Apparently the organism is strongly attracted to the cerebro-spinal fluid, into which it quickly passes *via* the choroid plexus of the lateral ventricle and perhaps other vascular structures of the brain and spinal cord and so causes the disease.

"The reason why the cocci as a rule do not pass in relays day after day from the mucous membrane of the nose into the blood is because the patient is either dead or the resistance is raised in a short time, but if this resistance again becomes lowered it is possible that relays may again pass from the nose and in this way a relapse or recurrent attack ensues.

"(5) The rare various strains of *Neisseria intracellularis* and to be successful in treatment a *polyvalent serum and a polyvalent vaccine made from local strains* are necessary.* Vaccine alone will cure many cases, but requires time to act, which may not be available, and hence the value of the serum in such cases, especially when followed by subsequent vaccine therapy.

"(6) Prophylaxis depends upon :—

"(*a*) The search for, isolation of, and treatment of cases and carriers, and here vaccine therapy is of use in helping to cleanse cases and carriers.

"(*b*) The increase of the immunity of the general population which can probably be done by prophylactic vaccination in doses of 5, 50, and 100 millions, but further experience is required of this when given on a large scale. There is little doubt that a negative phase is produced, at all events at times, in the first stages of this vaccination, and this may possibly be aggravated by fear, poor or insufficient food and bad hygiene. It also appears to us that vaccine prophylaxis ought to be tried on a large scale, as it causes no general or local symptoms if the germs are killed at 50° C., and the vaccine is aseptic and isotonic with the fluids of the body, and if the site of injection is the subcutaneous tissue just below the angle of the scapula, which in our opinion is the best place for prophylactic and other subcutaneous injections.

"(7) There are a great many questions with regard to epidemic cerebrospinal meningitis which are at present unsolved, and one of the most important appears to be the question as to whether any animal or animals act as hosts of the germ."

A. G. B.

ARLO (J.). **La méningite cérébro-spinale à Kindia, Guinée française (Janvier-Avril 1916).**—*Bull. Soc. Path. Exot.* 1916. Oct. Vol. 9. No. 8. pp. 351–356. With 3 charts.

The first case was diagnosed in January, in a boy of 14; lumbar puncture was done and diplococci not staining with Gram were found sparsely in the polynuclears, of which the fluid contained large numbers. Lumbar puncture was then done on all the sick tirailleurs in the hospital, suffering, according to their tickets, from extreme lassitude (*courbature*) with fever, bronchitis, broncho-pneumonia, and malaria, with the same result in many. Eighteen cases were treated by the author with 14 deaths. In April the epidemic was over. The symptoms differed with almost each patient. Most presented themselves for general weakness with headache and fever, usually slight. Many had transitory signs of pulmonary congestion or bronchitis. An autopsy was made in each case of death. Details of four of the less typical cases are given, with temperature charts. Treatment was symptomatic. Lumbar puncture appeared useful. The diplococcus was cultivated once and a guinea-pig was infected. No European was attacked. The origin was not determined. The disease is likely to spread because some infected natives deserted and went to their own villages to die. The population of Kindia is about 4,000.

A. G. B.

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* So this sentence runs in the original.

CHALMERS (Albert J.) & MARSHALL (Alexander). **Equine and Bovine Streptococci as Causal Agents in Human Infections.**—*Jl. Trop. Med. & Hyg.* 1916. Sept. 15 & Oct. 2. Vol. 19. Nos. 18 & 19. pp. 213–215 & 225–228.

This forms the "fifth of a series of short notes upon the streptococcal infections of the Anglo-Egyptian Sudan" [see this *Bulletin*, Vol. 7, p. 392–5]. An endeavour is made "to trace to their sources the pathogenic cocci found in puerperal fever and in sore throats." Tables show the leading cultural features of the streptococci in each group of affections (7 cases puerperal fever, 6 sore throat) and the authors conclude from the data therein set down that the cases of puerperal fever were due to *S. salivarius* Andrewes and Horder, *S. bovinus* Broadhurst (syn. *S. bovis* Chambers and Atiyah), and *S. versatilis* Broadhurst, whereas the sore throat streptococci were *S. bovinus*, *S. versatilis* and *S. actuosus* Chalmers and Marshall; in all, four species. A definition of the last-named, new, species is furnished. The provisional diagnostic table (*loc. cit.*) is now reproduced, with two alterations—the Mastitidis group becoming the Gasogenous group and the S. H. and S. group becoming the Non-fermenting group. Comparison of this table with those just referred to shows that *S. salivarius*, *S. bovinus* and *S. actuosus* belong to the Salivarius group and *S. versatilis* to the Faecalis group. The Salivarius group is now defined; it is divided into a typical and an atypical sub-group, but strains of the three species named above are found in each sub-group.

To find the natural habitats of these species the authors examined the faecal matter of man, horse, and ox; "zibla," a derivation of the faeces of the last two; and human saliva. The result of each investigation is summed up in a table. Here it can only be said that in equine faeces were found *S. versatilis* (8 out of 10 strains), and *S. faecalis*; in bovine faeces *S. versatilis* (7 out of 11 strains), *S. bovinus*, *S. mitior* and *S. faecalis*; in "zibla" (a mixture applied to the roofs and walls of houses throughout the Sudan) *S. mitior*, and *S. bovinus*; in human faeces *S. versatilis* (4 out of 10) *S. faecalis* and *S. bovinus* and in human saliva *S. bovinus*, *S. versatilis*, *S. faecalis* and *S. salivarius* (one strain). The findings in dry zibla show how resistant streptococci may be to heat and dryness. *S. mitior* and *S. faecalis* have both been met with as pathogenic agents in man. *S. actuosus* was not found in any of the substances examined, it is a haemolytic species and, according to BROADHURST, such strains appear to be most common in the canine alimentary canal. It is pointed out that the results obtained agree in general with those of the American workers. A. G. B.

SAMUELS (William F.). **General Paralysis of the Insane in Federated Malay States.**—*Jl. Mental Sci.* 1916. Apr. Vol. 62. No. 257. pp. 411–415.

The author is Medical Superintendent of the Central Lunatic Asylum, Tanjong, Rambutan. Three cases of general paralysis in Chinese are described, in one of which an autopsy was obtained. In one case there was "exaltation, grandiose delusions, extreme facility, tripping now and then over a word; later, actual slurring of speech, tremulous lips and tongue, unequal pupils with loss of light reaction" and lastly a paralytic seizure. The demented type is by far the most common.

In 1912–14 out of 977 admitted there were 33 cases of general paralysis, giving a percentage of 3·38. The percentage among males was 3·7, among females 2·26. Thus general paralysis of the insane in the F.M.S. "cannot even be described as a rare occurrence." [In this connection see Dr. MOTT's review of van BRERO's monograph on Nervous and Mental Diseases in the Tropics, this *Bulletin*, Vol. 4, p. 115.]

A. G. B.

PANAYOTATOU (Ang.). *Coccobacillus buccalis.—C. R. Soc. Biol.* 1916. Apr. 15. Vol. 79. No. 8. pp. 291–292.

From two cases of ulcerous stomatitis the author has isolated a microbe that appears to be the cause of this disease, which is very frequent in Egypt in children up to the age of 10. The microbe has the form of a coccobacillus and probably belongs to the genus Pasteurella. It stains well with aniline dyes and is decolourised by Gram. It grows well on the usual media. A description is given of its growth in bouillon and on agar. It is aerobic. An account is given of the symptoms produced in rabbits, into the veins of which it is introduced. Subcutaneous inoculation gives a localised lesion. From ulcerations thus produced the author has recovered the coccobacillus in pure culture. [Evidence is not given that the organism is the cause of ulcerative stomatitis.]

A. G. B.

STEVENSON (A. C.). **Morphia Injector's Septicaemia (Whitmore's Disease).**—*Trans. Soc. Trop. Med. & Hyg.* 1916. June. Vol. 9. No. 7. pp. 218–219.

The author showed specimens, illustrating the pathology of WHITMORE's disease, presented to the Wellcome Bureau of Scientific Research. For symptoms and post mortem appearances see this *Bulletin*, Vol. 7, p. 334. On the bacteriology the author writes:—

> "Amongst, and in the leucocytes in the alveoli, small beaded bacilli are seen. They do not retain Gram's stain, nor are they acid fast. Their length and the number of beads in them vary considerably. When cultivated on ordinary media they appear as short rods, with generally two dark staining dots in them; on salt agar they grow into long filaments. They are motile in the early stages of cultures, but this soon disappears.
>
> "Inoculation into guinea-pigs invariably leads to a fatal result with the formation of nodules. If only a small dose is used, ½ to 1 minim of an 18 hours' broth culture, intraperitoneally, enlargement and inflammation of the testicle is got, as in Strauss' sign in glanders, in about 36 hours. With large doses death ensues too quickly. Guinea-pigs are also capable of infection by feeding with cultures."

A. G. B.

PASTEUR INSTITUTE OF SOUTHERN INDIA, COONOOR. **The Annual Report of the Director together with the Ninth Annual Report of the Central Committee of the Association.**—29 pp. 1916. Madras: Supt Govt. Press.

The number of patients treated for hydrophobia during the year was 1,490, an increase of 280 over the preceding year; 63 were Europeans. Thirteen died of hydrophobia, three during the treatment, three within

15 days of its conclusion, and seven later. These last are classed as failures giving a rate of 0·47 per cent. The virus was at its 524th passage at the end of the period under review. From the results of a study of the literacy of the patients it is concluded that only about two per cent. of the persons in the Madras Presidency who were bitten by dogs suspected to be rabid come to Coonoor for treatment. The report states that the grant of free railway passes and maintenance during the period of treatment to persons who are certified by their local authorities to be indigent, and if necessary to an attendant also, has opened up a new means of livelihood. One man has come on not less than six different occasions, in attendance generally on "relatives." A series of tables gives many sorts of details. In 1,438 cases the biting animal was a dog, in 37 a jackal, and in the remaining 15 cases a man, cow, cat, ass, horse or monkey. In only 294 cases was there evidence, either laboratory or medical, of rabies in the biting animal, but in 785 instances the animal was "probably rabid." Figures of treated and untreated persons in 1913–14, 14–15 and 15–16 show that "the treatment more than halves the chances of death from hydrophobia." These are instances in which the biting animal bit more than one person. The proof that an animal had rabies does not necessarily show that its bite was infective. "The risk of death run by persons bitten by some mad dogs is about 40 per cent., by other mad dogs practically zero; no man can yet decide whether the mad dog was infective at the time of biting or not."

The Director's Report is followed by that of the Central Committee of the Association.

A. G. B.

i. SERGENT (Etienne). **A propos de la distribution géographique du goître en Algérie.**—*Bull. Soc. Path. Exot.* 1916. June. Vol. 9. No. 6. p. 314.

ii. de BERGEVIN (Ernest) & SERGENT (Etienne). **A propos de l'hypothèse de la transmission du goître endémique par un insecte piqueur.**—*Ibid.* p. 345.

iii. JEANSELME (E.). **Répartition des eaux minèrales et de l'endémie goîtreuse au Yunnan.**—*Ibid.* July. No. 7. p. 414.

i. In 1909 Dr. Et. Sergent published a paper on the geographical distribution of goitre in Algeria, illustrated by a chart which showed the disease to be prevalent in the valleys of the northern slope of the Atlas, south of Algiers, and on similar slopes in the Kabylie mountains, and near Bougie*, but not on the plateau nor southern slopes of the Atlas. REPIN reproduced this chart and indicated on it the mineral springs of the country†. These also are found in the great majority on the northern slopes of the Atlas. From the distribution of the mineral springs REPIN thought that goitre should occur between Oran and the Moroccan frontier. This now turns out to be the case, goitre having been recently reported from this region.

ii. In the second paper the authors refer to the finding by BOUILLIEZ of a Reduviid bug, *Acanthaspis sulcipes* Fabr. in a part of Central Africa where goitre was endemic [see this *Bulletin*, Vol. 7, p. 314].

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* *Bulletin de la Société de Pathologie Exotique*, 1912, Vol. 5, p. 122.

† *Loc. cit.*, p. 299.

This insect is not known in the goitrous districts of Algeria. There is a nearly allied genus but it has not been reported as biting man. Other bugs mentioned either do not bite man or do not occur in the mountains.

iii. This author in 1905 published a list of mineral springs found in Yunnan. In 1910 he studied the distribution of goitre and cretinism in that country and found that this distribution was almost identical with that of the mineral springs.

A. G. B.

NICHOLSON (M. A.). **The Effect of Typhoid Inoculation on Endemic Goitre at the Lawrence Military Asylum, Sanawar, Punjab [1900 to 1912].**—*Lancet.* 1916. Aug. 12. pp. 275–277.

The theory of causation of endemic goitre by infective organisms probably of intestinal origin and water-borne was suggested by Major MCCARRISON [*Lancet,* Feb. 8, 1913] and that theory prompted the work which Captain Nicholson, I.M.S., records in the paper under notice. Careful enquiry into registers, kept in the Sanawar Asylum for the children of British soldiers serving in India, leads to the final conclusion :—

" Typhoid inoculation at Sanawar had no effect in any way on the course of the endemic goitre there, either individually or collectively."

J. H. Tull Walsh.

MCNEIL (H. L.). **Syphilis in the Southern Negro.**—*Jl. Amer. Med. Assoc.* 1916. Sept. 30. Vol. 67. No. 14. pp. 1001–1004.

The author examined a series of 1,200 adult negroes admitted to hospital at Galveston by the Wassermann and luetin tests. Doubtful reactions were considered negative. In only half could the luetin test be successfully followed. He notes that " a positive luetin can be produced at will on non-syphilitic individuals, by the previous administration of the iodids in sufficient quantities."

Of the 1,200 negroes 34 per cent. gave positive Wassermanns (Noguchi's modification) and 18 per cent. positive luetins, the total percentage giving positive reactions to one or both tests being 42. To determine the actual prevalence of syphilitic infection in the healthy working negro he examined 200 admitted to the surgical wards, ruling out any that were diseased ; 24 per cent. gave positive Wassermanns and 28 per cent. were positive to one or other test. A limited study of children (52) gave 9·5 per cent. positive Wassermanns, showing that the majority of the cases of syphilis are acquired.

The author proceeds to group the 400 medical cases, with 45 per cent. laboratory evidence of syphilis, into three divisions. Among those diseases which appear to be unconnected with syphilis, the positive Wassermanns being about 30 per cent., are pulmonary tuberculosis, typhoid fever, malaria, pneumonia, dysentery, pellagra, cancer, chronic interstitial nephritis and arteriosclerosis. Diseases " perhaps indirectly associated with previous syphilitic infection " are, an acute or subacute diffuse nephritis with dropsy, a common cause of death among negroes, spastic paralysis or paresis, and myocarditis. The diseases constantly associated with syphilis are, aneurism of the thoracic aorta, aortic insufficiency, and bone pain, usually called rheumatism or lumbago. On the surgical side there stand out rectal troubles and chronic leg ulcers. These points are illustrated in the table.

Occurrence of Syphilis in the Commoner Diseases, as Determined by Positive Wassermann Reactions on the Negro.

Disease.	No. Cases.	Per Cent. Positive Wassermann.
Apparently healthy adult negroes ..	200	24
Negro children	52	9·5
Pulmonary tuberculosis	60	23
Typhoid	13	22
Malaria	7	12
Dysentery (amebic and bacterial) ..	12	20
Pneumonia	30	30
Pellagra	22	13
Cancer	17	12
Arteriosclerosis (or senility)	18	23
Chronic interstitial nephritis	4	25
Diffuse nephritis (often subacute or acute)	60	48
Paralysis	34	50
Myocarditis (uncomplicated by organic valvular lesions or by nephritis) ..	21	40
Cirrhosis of liver	6	66
Aneurysm of thoracic aorta	12	83
Aortic insufficiency	20	75
Syphilitic bone or joint pains	30	80
Rectal abscess	4	75
Rectal stricture	10	90
Rectal fistula	13	61
Hemorrhoids	9	22
Chronic leg ulcer	18	55

The author writes :—

"The occurrence of syphilis among white people of the same social class as the negroes would seem to be about the same as that among the negroes. In the better classes of white people, however, the occurrence is much less, while in the best classes (young and healthy medical students), it is almost *nil.*

"Syphilis is undoubtedly one of the chief causes of death and disease among the negro, ranking as high or higher than tuberculosis, Bright's disease and pellagra, which are the three other chief causes of death and disability among that race in this community."

A. G. B.

Jamison (S. Chaille). **Certain Phases of Syphilis in the Negro Female from the Standpoint of Medical Diagnosis.**—*New Orleans Med. & Surg. Jl.* 1916. Aug. Vol. 69. No. 2. pp. 96–97.

The observations made in this short paper are based on the cases of syphilis diagnosed in the examination of 1,000 consecutive medical cases seen at New Orleans. Of these 166 were diagnosed as syphilis, or 16·6 per cent. It heads the list, tuberculosis coming next, and malaria a bad third. The author expresses surprise at the rarity of skin lesions. It is his impression that the blacks are rather exempt from these. On the other hand mucous patches are common and the Treponema can usually be easily demonstrated in them. "The incidence of syphilitic arthritis in " chronic rheumatism " is very high among the negro females " ; pain, worse at night, is the commonest symptom. The Wassermann reaction was done on half the cases and was positive in about 80 per cent. There were two cases of tabes, and one of paresis.

A. G. B.

SICARD (J. A.) & LÉVY-VALENSI (J.). **Syphilis latente des Arabes. Réactions du sang et du liquide rachidien.**—*Bull. et Mém. Soc. Méd. des Hôpit. de Paris.* 1916. July 13. 3 ser. Vol. 32. No. 23–24. pp. 1087–1088.

It is generally known that syphilis, though common, is a benign disease among Arabs, and that nervous manifestations are rare. The authors examined 30 wounded Arabs, Algerians and Moroccans, aged from 20 to 35. The Bordet-Wassermann reaction (it is pointed out in a footnote that these names should replace that generally used) in the blood showed 6 cases clearly and 2 slightly positive ; that of the cerebro-spinal fluid (28 cases) showed 3 positive and 2 slightly positive. In the cerebro-spinal fluid (24 cases) there was hyperalbuminosis in 7 cases.

The conclusion is that humoral syphilitic manifestations were present in almost a third. Clinical symptoms, though searched for, were not found in any case.

A. G. B.

LONGMAN (Heber A.). **Notes on Classification of Common Rodents. With List of Australian Species.**—*Commonwealth of Australia Quarantine Service.* Publication No. 8. 1916. 28 pp. With 7 figs. Issued under the Authority of the Minister for Trade and Customs.

Dr. CUMPSTON, Director of Quarantine, Commonwealth of Australia, tells us in a preface that it was considered desirable to have a short description of the principal species of rodents met with on vessels coming to Australia and that the services of Mr. Longman of the Queensland Museum were obtained for the purpose. Hence the present publication. In the introduction the part played by the rat in plague, as a host for *Trichinella spiralis*, and as an agent of destruction, is described, while on the credit side there is only the fact that it is in some degree a scavenger. The true rats and " marsupial rats " are then compared ; though superficially alike they are readily distinguished by the dentition, as is shown in a figure. An outline is then given of the groups of Muridae occurring in Australasia. Extended descriptions follow of the Australian species and such exotic species as might be introduced. The rodents illustrated are *Hydromys chrysogaster* Geof., the Australian water rat (skull figured) ; *Epimys rattus* Linn., the black rat ; *Epimys norvegicus* Erxl., the brown rat ; *Pseudomys novae-hollandiae* Waterhouse, the field mouse ; *Notomys longicaudatus* Gould, a jerboa rat ; *Uromys macropus* Gray, the

Queensland giant rat. A diagrammatic representation from three aspects of the skull of the brown and black rat respectively shows how these may be distinguished by the relation of the width of the brain case to the length of the parietal. There is a section on the preservation of specimens and a list of Australian rats. Appendices deal with rat poisons and the inspection of vessels for rat infestation (by Dr. ELKINGTON), and with rat bite fever. Clearly this publication will be useful to others than Australians. A. G. B.

BALFOUR (Andrew). **The Medical Entomology of Salonica.**—An Address delivered to the Salonica Medical Society, May 17, 1916. 25 pp. With 31 figs. Wellcome Bureau of Scientific Research. London, W.

In this interesting and lively address given before the Salonika Medical Society in May 1916 the author talks of the house fly, two species of Fannia, the blue-bottle and green-bottle flies, *Stomoxys calcitrans*, Sarcophaga, Hippobosca, mosquitoes and Notonecta, *Phlebotomus papatasii*, Simulium, lice, bugs, fleas and the itch-mite. All these and others are illustrated in the various stages of their life histories. The address hardly lends itself to summary but some points of interest may be indicated. After an account of the well-known misdoings of the house fly the author proceeds :—

> " I want to-day specially to direct your attention to what happens in the case of amoebic dysentery as recently worked out by Lieut.-Colonel Wenyon and Captain O'Connor, R.A.M.C., at the Orwa-el-Waska Hospital in Alexandria, not only for *Musca domestica*, but for *Fannia canicularis*, the little house or latrine fly, and for both Green-bottles and Blue-bottles. . . . Within 20 or 30 minutes of feeding on human faeces, and in some cases even five minutes after such a feed, flies begin to deposit droplets of liquid faeces, and in these the unaltered and living cysts [of *E. histolytica*] can be seen if the faeces on which the fly has been feeding contained them in the first instance. Within a few hours thousands of cysts may pass through a single fly, and if the fly finds its way to food, as it so commonly does, they are deposited on the latter, and the way made easy for a dysenteric attack."

The three Greek species of Anopheles appear to be *maculipennis*, *superpictus* and *bifurcatus*. It appears that in May 1916 fifteen hundred acres of swamp near Salonica had been drained; Balfour writes, " I have not seen such extensive drainage operations since I witnessed the colossal work of the Americans in the Panama Canal Zone." Speaking of the breeding places of Phlebotomus he adds to those generally listed, the earthen parapets of trenches. About bugs he says, " They have never yet been absolutely definitely convicted of carrying any human disease." [This is the truth although the bug is often inculpated by medical as well as lay men. There is perhaps a general tendency to apply to nature the results of a laboratory experiment.] Col. Balfour, like the Master of Christ's, so leavens his instruction with humour that digestion is a pleasant and easy process.
A. G. B.

MACFIE (J. W. Scott) & INGRAM (A.). **The Domestic Mosquitos of Accra.** — *Bull. Entom. Res.* 1916. Oct. Vol. 7. Pt. 2. pp. 161–177. With 2 maps.

A careful examination has been made of all the mosquito larvae collected at Accra by the Sanitary Inspectors during a complete year, December 1914 to November 1915. Accra is described as a dry and dusty town, the rainfall in these 12 months being 21·75 inches. In the 417 samples of water submitted ten different species were found, seven of which came from native compounds. In 1910–11 GRAHAM made a similar study of the larvae found in native water receptacles at Lagos, examining 1,043 samples; he found six species of mosquito. These findings are compared and contrasted in Table II. Only four species are common to the two lists.

TABLE II.

The percentages in which the larvae of the various mosquitos occurred in the native compounds at Accra (411 samples) and at Lagos (1,043 samples).

Species of Mosquito.	Accra.	Lagos.
Anopheles costalis	1·0%	1·8%
Culex decens	0·7	1·8
Culex duttoni	..	8·3
Culex fatigans	14·8	..
Culex invidiosus	0·2	..
Culex tigripes var. *fusca*.	0·2	5·3
Culiciomyia nebulosa	..	21·6
Stegomyia fasciata	90·0	92·5
Stegomyia metallica	0·2	..

To show the seasonal distribution, the monthly proportions in which larvae of the three types—Anopheline, Stegomyia, and other Culicine—have been found in samples sent to the laboratory from all sources during 1912–15 are indicated in another table, and another shows the distribution of samples containing Stegomyia during 1915. The conclusion is that there is no seasonal variation, and it is noted that domestic mosquitoes are probably independent of rainfall. The authors go on to consider the distribution of the larvae in the various blocks into which, for sanitary purposes, Accra is divided. Table V shows the specimens of larvae—Stegomyia, other Culicines, and Anophelines—collected in 1912–15 distributed according to blocks and the same is indicated graphically on a map. It is seen that mosquitoes breed most freely in the middle of Accra, the most densely populated part. Stegomyia, "which practically means *S. fasciata*," occurs in large numbers in every block; Culicine larvae, "practically *Culex fatigans*," in smaller numbers in every block; and *Anopheles costalis* in very small numbers in most blocks. The authors ask how it is that *A. costalis* is found breeding in water receptacles in compounds; they think it probable that breeding is voluntary in these situations, *i.e.*, not caused by want of pools.

Forty-one species of mosquito have been collected at Accra; these are named. During eight of the 12 months one of the authors living in the European quarter collected all the mosquitoes he could. The result is shown in Table VI.

TABLE VI.

The mosquitoes, arranged in order according to the frequency of occurrence, found at Accra (*a*) as adults in bungalow A, 1st December 1914 to July 1915, and (*b*) as larvae in the samples sent to the laboratory by the Medical Officer of Health during the same period.

Adults.			Larvae.		
Species.	No. caught in bungalow.	Percentages.	Species.	Number of samples in which they were found.	Percentages.
Mansonioides africanus ..	129	46·0	*Stegomyia fasciata* ..	342	82·0
M. uniformis	81	28·9	*Culex fatigans*	59	14·1
Culex thalassius	31	11·7	*Anopheles costalis* ..	3	0·7
Anopheles pharoensis ..	11	3·9	*Culex decens*	3	0·7
A. costalis	10	3·5	*Culiciomyia nebulosa* ..	3	0·7
Culex fatigans	6	2·1	*Stegomyia leuteocephala*.	2	0·5
Anopheles funestus ..	3	1·0	*Stegomyia metallica* ..	2	0·5
Culex duttoni	2	0·7	*Culex invidiosus* ..	1	0·2
Ochlerotatus irritans ..	2	0·7	*Culex tigripes* var. *fusca*	1	0·2
Culex decens	1	0·3	*Stegomyia unilineata* ..	1	0·2
Culex insignis	1	0·3			
Culex invidiosus	1	0·3			
Micraedes inconspicuosus	1	0·3			
Stegomyia fasciata ..	1	0·3			

"Only five species are common to the two lists, namely, *Anopheles costalis*, *Culex decens*, *C. fatigans*, *C. invidiosus*, and *Stegomyia fasciata*, and whereas *Mansonioides africanus* and *M. uniformis*, by far the commonest mosquitos in the bungalow, do not figure at all among the larvae, *Stegomyia fasciata* which heads the list of larvae is last on the list of mosquitos."

The causes of these differences are discussed and it is noted that 156 mosquitoes were collected in a native's house in a block abounding in *S. fasciata* larvae and yet not a single specimen of this species was amongst them. One probable explanation is that *S. fasciata* "does not roost indoors."

"A consideration of the two lists shown in Table VI convinces us that an examination of the larvae found in the compounds not only fails to give any adequate idea of the mosquito fauna of a town, but also fails to indicate the species of mosquitos to the attacks of which the inmates of the houses are liable. It also furnishes proof of the necessity for extending anti-mosquito measures so as to reach the species that breed far afield."

The paper closes with a note on the distribution of some of the commoner mosquitoes found on the West Coast of Africa and their numerical distribution is roughly given in Table VII at Accra, Lagos, Ashanti and the Northern Territories. The result is to show that some mosquitoes are commoner at the coast and others inland, the variations depending perhaps on the food supply of the larva.

A. G. B.

LEGENDRE (Jean) & PERRIER (Edmond). **Destruction des moustiques par les poissons.**—*C. R. Acad. Sci.* 1916. Oct. 9. Vol. 163. No. 15. pp. 377–378.

The fish which adapt themselves best to the conditions of life in rice fields are those which like calm and warm water, especially the Cyprinidae. The author has started a piscicultural station near Tananarives in Madagascar where the area of rice cultivation is 300,000 hectares. Here he has introduced two kinds of Cyprinidae, "*Carpe miroir*" imported from France, and "*Carpe Maillart*" from Réunion. He has found that the gold fish, *Carassius auratus*, devours mosquito larvae readily in the rice fields and increases with great rapidity, e.g., 1,300 fish were introduced in January into an area of about a hectare, and five months later 18,000 were taken out. The Malagasies are very fond of fish and the author believes that *rizipisciculture,* as he calls it, has a fine future in Madagascar. [This is a favourite subject of the author's. See, for instance, this *Bulletin,* Vol. 2, p. 329, where more information is given; on the general question Vol. 2, p. 652–4 may be consulted.]

A. G. B.

WURTZ (R.). **Rapport sur la nécessité de donner aux autorités sanitaires, en France, le droit de rechercher et de détruire les larves de moustiques, au nom d'une Commission composée de MM. Laveran, Blanchard, Roux, Mosny, et R. Wurtz, Rapporteur.** —*Bull. Acad. Méd.* 1916. Sept. 12. 3 ser. Vol. 76. 80 Year. No. 36. pp. 189–195.

The fact that in the last two years several cases of malaria have been reported in France, as a result of the increased number of malaria carriers during the war, has led to the appointment by the Academy of Medicine of a Commission with instructions to report on the need for giving the French sanitary authorities the right to search for and destroy mosquito larvae. The immediate cause was this. The reporter, Dr. Wurtz, made an attempt to enquire into the cause of the prevalence of mosquitoes in Paris and sought permission from the Prefecture of Police to enter premises suspected of harbouring larvae; it was refused on the ground that there were no regulations on this subject. Malaria appears to have always existed in Paris, at any rate till quite recently; in 1886, 131 cases were reported by RIVES as seen in eight years, and several cases at the time of the Exposition in 1900. Anopheles have never been found, though *A. maculipennis* exists in the suburbs and in neighbouring Departments. It is suggested that transmission may have been effected in some cases by Culex by the soiled proboscis method. The author knows from personal experience that mosquitoes have increased in Paris in the last 25 years, and he attributes this to the establishment of the water carriage system, unused flushing reservoirs serving as breeding places though it does not appear that he has found larvae in them. He gives a brief account of the work done in French tropical colonies by anti-mosquito brigades and points out that the same programme is needed at Paris though on a much smaller scale; instead of being carried out daily it would only be set in action at the request of one or more inhabitants.

The Commission agreed that the powers given to sanitary authorities for the prevention of epidemics should be widened to include the detection and destruction of mosquitoes, and should include the right to visit premises and to give directions as to the measures needed.

A. G. B.

da COSTA LIMA (A.). **Contribução para o estudo da biolojia dos culicidas. Observações sobre a respiração nas larvas.** [A Contribution to the Study of the Biology of Culicidae. Observations on the Respiration of the Larvae.]—*Mem. Inst. Oswaldo Cruz.* 1916. Vol. 8. No. 1. pp. 44–49. With 3 text figs.

In reply to a criticism by SEN, in the *Indian Journal of Medical Research*, the author explains the details of his methods for studying the mechanism of respiration in the larvae of gnats. The larvae were confined in various ways in receptacles below the surface of water in jars in such a manner that they could not rise to the surface. He concludes that the larvae of all species of gnats normally depend upon their anal syphons for respiration, but that, when young, they can absorb oxygen to a certain extent also from the air present in the water. Details are given of various experiments intended to elucidate this point, which is of course of practical importance in connection with the oiling of surfaces of water. It is mentioned that the larvae of Mansonia have two little hooks at the end of the syphon, which they insert into the submerged parts of certain aquatic plants, so as to be able to inspire the air contained in the air-canals which ramify in the tissues of such plants (*Pistia stratiotes*, e.g., as noted by N. W. B. MOORE and confirmed by the author and LUTZ).

J. B. N.

BACOT (A.). **The Use of Insecticides against Lice.**—*Brit. Med. Jl.* 1916. Sept. 30. pp. 447–450. With 2 figs.

The experiments detailed in this paper were arranged " on as nearly natural a basis for the insects as was consistent with their control and strictly comparative results." The substances used were cytisine (an alkaloid of similar physiological properties to nicotine), naphthalene, sulphur, " cresylic acid," iodoform, vermijelli and other combinations. In later trials cloth was impregnated with various substances in dilute solutions, " remedies of low cost and slow action."

" These latter trials suggest that a practical remedy may be found for preventing the spread of lice among troops by the use of a ' crude liquid carbolic acid ' and soft soap emulsion for the impregnation of shirts and underclothing. The emulsion should consist of 45 per cent. to 50 per cent. of soft soap, combined by heating with 50 per cent. to 55 per cent. of the crude carbolic. The strength of the solution used to impregnate the garments should be 5 per cent. of the emulsion in warm water, 3 per cent. being too weak for practical use ; while solutions above 5 per cent. might cause irritation to the skin. After dipping, the garments should be wrung and thoroughly dried before wearing. A normal sized flannel shirt after wringing will retain about 500 to 600 ccm. of the solution, and the cost would probably, apart from labour, be about one halfpenny per shirt.

" What is now required is a test on a practical scale to ascertain (*a*) what percentage of men are likely to have irritable skins which might be susceptible to the small percentage of cresols in the shirt, and (*b*) to ascertain the efficacy of the remedy to keep men free from lice in the field."

A. G. B.

WEIDMAN (Fred D.). *Pneumonyssus foxi*, Nov. sp. **An Arachnoid Parasitic in the Lung of a Monkey** (*Macacus rhesus*).—*Jl. of Parasit.* 1915. Sept. Vol. 2. No. 1. pp. 37–45. With 1 plate.

The parasites were obtained from the lungs of an adult *Macacus rhesus*, which died in the Philadelphia Zoological Gardens with subacute catarrhal colitis. There were 16–20 nodular lesions, 2–5 mm. in diameter, immediately under the pleura and slightly elevated. When fresh they were pink or grey. Two of these were gently scraped out, one yielding eleven females and one male, the other five females. Free larvae or ova were not found. Grossly, the arthropods were just visible. The female and the male are described in detail. The author states that in several respects the parasite does not agree with the genus *Pneumonyssus*, but he is unwilling to announce a new genus. This appears to be the fifth species of arachnid described from the air passages of a monkey, BANKS, NEWSTEAD, and LANDOIS and HOEPKE having described the others. The points wherein this parasite differs from the rest are stated, and the paper closes with a technical description of the new species, part of which is furnished by Dr. BANKS.

A. G. B.

Reprints and Pamphlets received:—

Chalmers (A. J.) & Archibald (R. G.). A Sudanese Maduromycoosis.—*Ann. Trop. Med. & Parasit.*

Chalmers (A. J.) & Christopherson (J. B.). A Sudanese Actinomysosis.—*Ann. Trop. Med. & Parasit*, 1916.

Elders (C.). Over Oesophagostomiasis.—*Tijdsch. v. Vergelijk. Geneesk.*

Elders (C.). Over besmetting van de urinewegen met een pseudopest-bacil bij den mensch.—*Nederl. Tijdschr. v. Geneesk*, 1916.

Dobell (C.) & Low (George C.). A Note on the Treatment of Lamblia Infections.—*Lancet*, 1916.

Lister Institute of Preventive Medicine. Collected Papers, 1914–15, No. 11, Part 1, Bacteriological, Epidemiological, Pathological and Statistical Papers. Part 2, Physiological, Zoological and Biochemical Papers, 1915–16, No. 12, Parts 1 and 2.

van Loghem (J. J.). Klimaat en Ziekte. Rede, uitgesproken bij de aanvaarding van het hoogleeraarsambt aan de universiteit van Amsterdam, den 6 den November 1916.—38 pp. 1916. Amsterdam: S. L. van Looy.

Low (G. C.). A Case of Amoebic Abscess of the Liver occurring Twenty Years after the Original Attack of Dysentery.—*Brit. Med. Jl.*, 1916.

Mitzmain (M. B.). Anopheles as a Winter Carrier of Plasmodium. The Mosquito as a Prophylactic Indicator.—*U.S. Pub. Health Rep.*, 1915.

Mitzmain (M. B.). Anopheles Infectivity Experimonts. An Attempt to determine the Number of Persons One Mosquito can infect with Malaria.—*U.S. Public Health Rept.*, 1916.

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Note.—On direct application (not through agents or booksellers) any of the foregoing reprints or pamphlets will be sent on loan to any part of the world, the Bureau paying outward postage.

Books received.

Beadnell (H. J. L.) [F.G.S., F.R.G.S.]. The Topography and Geology of the Fayum Province of Egypt, Survey Department Egypt.—101 pp. With 24 plates. 1905. Cairo: National Printing Dept.

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Willcocks (Sir W.) [K.C.M.G., F.R.G.S.] & Craig (J. I.) [M.A. (Edin.) B.A. (Cantab), F.R.S.E., F.R. Met. S.] With an Introduction by Sir Hanbury Brown [K.C.M.G.]. Egyptian Irrigation.—Vols. 1 and 2. 884 pp. Illustrated. 1913. London: E. and F. N. Spoon, Ltd.

The Bureau is indebted to the MEDICAL RESEARCH COMMITTEE (Insurance Act), per Dr. R. T. LEIPER, for the gift of 37 large scale maps of Lower Egypt and the books above named.

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TROPICAL DISEASES BULLETIN

14 MAY 1917

Vol. 9. 1917. No. 3.

SANITATION NUMBER

ISSUED UNDER
THE DIRECTION OF THE
HONORARY MANAGING COMMITTEE
OF THE
TROPICAL DISEASES
BUREAU.

General Editor:
THE DIRECTOR OF THE BUREAU.

London:
TROPICAL DISEASES BUREAU,
Imperial Institute, S.W.

Sold by BAILLIÈRE, TINDALL & COX,
8, Henrietta Street, Covent Garden, W.C.

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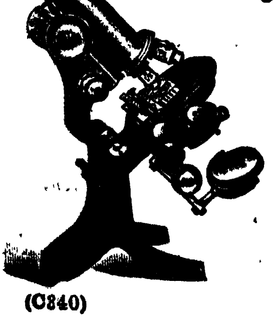

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Ref., The Lancet, 26/6/15—

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TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 9.] 1917. [No. 3.

APPLIED HYGIENE IN THE TROPICS.*

By Colonel W. G. King, C.I.E., I.M.S. (Retired).

REPORTS.

Corporation of Madras, 1915–16.†

In this Report, the relation which sanitation bears to finance, and the influence of factors inhibiting, or aiding, advance are well illustrated by concrete facts :—

Inter-relation of water-supply and drainage.

> "The maximum water-supply of the city in former days, when water was distributed by gravitation, was approximately seven million gallons per day. The new pumping installation at Kilpauk supplies on an average twice that quantity, and has on occasion supplied up to 20 million gallons per day. Though the cost of this pumping (inclusive of establishment) during 1915–16 amounted to more than a lakh, no reasonable person could wish for a return to the old conditions. To the part played by increased water-supply in improving our vital statistics in the past year the Health Officer has testified ; it is a fair assumption that much of the deplorable mortality of Madras has hitherto been due not so much to bad water as to the absolute lack of water of any kind. Increased water-supply necessarily means increased sewage ; the cost of sewage pumping has risen from Rs.60,000 in 1903–04 to Rs.154,000 in 1915–16, and with the laying of water pipes into parts of the city hitherto untouched this cost will rise still further in 1916–17." [p. 3.]

* [During the previous period of issue of the "Sanitation Number" of the Bulletin, the endeavour of the writer has been to cull from official and other Reports descriptions of methods of Applied Hygiene as adopted in various and often widely separated areas of the Tropics, and contrast these and the opinions on which they are supported by the sanitarians respectively concerned. This is ordinarily the process by which the sanitarian arrives at his conclusions of the value of new or untried methods, before advising their employment by public authorities. In the present Number the method is adopted of quoting extracts from Reports more fully, leaving the reader, as evidence is thus accumulated, to make his own contrasts.]

---

† Administration Report of the Corporation of Madras for 1915–1916. 1916. Madras : Printed by Thompson & Co., 33, Popham's Broadway.

The tram as a factor in relief of overcrowding.

" Congestion in Madras will never be relieved till we have more tram lines. The Corporation has acquired for demolition extensive rookeries in Triplicane; these cannot be pulled down until some possibility of accommodation is provided for the evicted. And poor people cannot move far from their work unless there be available some cheap and easy method of getting back to it." [p. 5.]

Demonstration as a factor in teaching the uneducated classes.

" I alluded to an increasing spirit of co-operation apparent in the attitude of the people towards our anti-malarial campaign. It is gratifying to record that this spirit has waxed, not waned. The drainage of the Puraswakkam swamps has been designed by Mr. Barker, and part of the design executed with marked success." [p. 5.]. " The construction of the Model Paracherri of 34 tenements in Cemetery Road, with the exception of the latrine which was under progress, was completed during the year at a total cost of Rs.18,130; and the tenements have been let to the conservancy sweepers at a rental of As.8 per tenement." [p. 23.] " His Excellency the Governor of Madras offered Rs-1,500 to provide prizes for a competition for the best design for the construction of model dwelling houses for the poor, and Mr. Madeley also offered Rs-100 for the best design of water-supply and drainage for certain classes of houses." [p. 4.]

Educate a dying people or first render life possible ?

" One portion of the building programme, I regret to say, has been dropped temporarily at least. The Corporation has been unable to carry out the provision of two primary schools for each division of the city. But when money is scarce, and the claims of sanitation and primary education come into conflict, it is, I think, but right and proper that sanitation should take precedence. It is of little use to educate a child while neglecting what best effort may be made to keep him alive; there are many agencies which provide the three R's, but the responsibility for the public health is primarily on the Corporation." [p. 6.]

Prevention of waste of water.

" The consumption during the past year is approximately twice what it was before the new water works were opened. . . . To reduce this waste, the Corporation has, during the past year, introduced regulations and rules to prevent waste, contamination, and misuse of water, and has also adopted the principle recommended by the Special Engineer of having two classes of house services : a first class service in which the consumer is required to hire water meters from the Corporation, and to adopt only specified fittings, the positions and numbers of which have to be approved, and a second class service in which the consumer is allowed to fix one tap of approved pattern, provided it is placed in such a position that it is visible fromthe road, and can at all times be inspected by the Municipal Staff.

" The Corporation has also introduced a scale of fees for connecting and testing house services, and for the rent of meters. The strict enforcement of the regulations should minimise waste of water due to leakage and misuse in the house services. In addition, there is undoubtedly leakage in the street pipes. This leakage is very difficult to discover, especially where the pipes are laid in sand.

" In Madras, iron pipes have a shorter life than in many other Cities, and experience has shown that a large proportion of the pipes laid 20 years and more ago are unsound. From these unsound pipes which include many house communication pipes, water must be escaping in thousands of small leaks. Many small leaks will account for a large total loss, which will be quite invisible in porous soils where the water gets away readily. To detect these hidden leaks, a complete waste-water meter system has been designed, and plans and specifications drawn up. The calling for tenders has been postponed on account of the war.

"With a view to reducing waste, a small special staff was sanctioned on 20th September 1915, to carry out house to house inspection. Up to 31st March 1916, 11,500 houses were inspected of which some 5,000 had leaky fittings." [p. 27.]

Does sewage irrigation pay in the tropics ?

"*Grass Farm—Tondiarpet.* The farm was worked departmentally, and the total receipts from all sources amounted to Rs.38,209. 2. 9. against Rs.37,438. 1. 1. in the previous year. There was on hand on the 31st March 1916, a stock of 50 tons and 1,516 lbs. of hay, the value of which at Rs.50 per ton amounted to Rs.2,533. 13. 5, so that the total income from the farm for the year under review may be placed at Rs.40,743. [p. 15.]

"The Special Engineer has submitted an approximate estimate amounting to Rs.12 lakhs for the acquisition of land, levelling and laying out the farm, purchasing and erecting pumping plant, and constructing pumping mains, channels, and distributaries and everything else necessary to force the sewage the three miles which separate the old and proposed farms, and to distribute it over the latter." [p. 30.]

Conservancy.

"Latrines. The acquisition of land for the construction of a flush-out latrine in Thambu Chetty Lane and the construction of a flush-out latrine at Polu Naicken Street Perambur was completed during the year.

"A new type of a sanitary urinal called 'Torfeit-Urinal' was installed in Wall Tax Road near the Central Station as an experimental measure, as it was represented by the manufacturers, Messrs. Vacha & Co., of Bombay, that by the introduction of these urinals, flushing by water might be entirely dispensed with and the latrines would be free from smell." [p. 23.]

Water-supply and health.

"The death-rate returns appear to prove that the new water-supply has improved the healthfulness of the city. The works were opened on 17th December 1914, and it is very interesting to note that while the death-rate during 1914 was 46·6 per 1,000, it dropped to 36.0 in 1915. Moreover, this death-rate is the lowest during the last 20 years with the exception of that of 1897 when it was 35·5. While it may be a coincidence that so great a drop in the death-rate has occurred during the first year that the new water-supply has been in use, still the fact that it is the lowest death-rate for so many years, makes it fairly safe to infer that the new supply has largely added to the healthfulness of the City, because, except for the water-supply, the health factors must have been at least as favourable during several other years." [p. 28.]

STATE OF NORTH BORNEO.

The Territorial Medical Report for 1914 for the State of North Borneo is written by Dr. W. B. ORME, Principal Medical Officer. The estimated population of the area was, in the period reviewed, 216,670. Registration of births and deaths was introduced in 1914. Judged by figures so gained, the birth-rate only amounted to 13·01 and the death-rate "exclusive of epidemic diseases" to 12·51 per mille. A part of the Report is occupied by a reproduction of a circular written for guidance of District Officers on the subject of water-supply.

Rainwater separator. Having pointed to the fact that rainwater as collected from roofs is often much contaminated, he describes precautionary measures as follows*:—

"Many separators which reject the first washings have been introduced but are mostly liable to get out of order. Personally I know of one method only which gives good results : a house is fitted with an ordinary guttering and rain-water discharge pipe, the lower opening of the latter being fitted with a plug. Some two feet from the top of the discharge pipe a second pipe, of the same diameter, comes off at a right angle and is carried t› the storage tank. At the onset of rain the first washings are allowed to flow down the ordinary channel and only when the water is quite clear and sweet is the plug introduced causing the water to rise in the discharge pipe and overflow into that supplying the storage tank.

---

* State of North Borneo Territorial Medical Report, 1914. Sandakan: Govt. Printing Office. [p. 5.]

" Storage tanks are best constructed of re-inforced concrete or galvanised iron. Wood is objectionable as vegetable growth occurs round the sides and Lead is distictly dangerous especially for soft rainwater which readily takes up the poison.

" The tanks should be protected from the sun and it is of paramount importance to adequately screen the opening of the tank with fine copper gauze to prevent the entrance of mosquitoes ; moreover by so doing it will be found that from time to time a considerable quantity of debris is prevented from entering the tank."

Protection of vaccine lymph during transit in the tropics.

" In order to avoid a repetition of arm to arm vaccination, which is rightly in the present day ruled out of court, I dispatched a weekly consignment of 200 lbs. of ice to Tenom and there instituted a lymph depôt. Installing the lymph safely at Tenom was not, however, a solution of the problem as the chief centres were at the following distances from it :—

Kaningau	30 miles.
Rundum	50 ,,
Tambunan	70 ,,
Ranau	120 ,,

" In order to deliver the lymph to the vaccinator in good condition Thermos flasks were sent (previously experimented with in my own house) for its conveyance. The instructions were to wrap the required quantity of tubes in thick brown paper, to prevent breakage, place in the Thermos and then fill the flask with broken ice. This method has proved quite successful and the Resident reports ' the results continue to be excellent.' Our vaccinator misunderstanding orders, and evidently having no acquaintance with a Thermos, believed that the magic bottle itself contained the precious vaccine in an unusually liquid form and vaccinated 133 persons with *aqua pura* before discovering the real tubes of lymph at the bottom of the thermos." [p. 10.]

STRAITS SETTLEMENTS.

The Straits Settlements Medical Report for the year 1915 estimates the total population of the Colony at 766,444. The Europeans numbered 8,086. Of the general population, the birthrate was 29·25 per mille, against 29·09 of the preceding year. The death rate was 29·15 against 34·13 of the previous year. The infantile death rate was 263·68 per mille of births.

The average number of European official residents was 322, with a percentage of death of 1·87.

Plague still appears in Singapore, but " the cases are of a sporadic nature distributed throughout the year occurring in various parts of the town, and with no discoverable sources of infection."

Deaths from beriberi have declined from 2,056 in 1911 to 1,079 in 1915. In Singapore 20,405 dollars were spent in drainage and minor anti-malarial works.

In the Pathological Department Dr. KEITH carried out a series of blood examinations (Wassermann) for syphilis amongst the inmates of the Lunatic Asylum. Of 228 patients examined nearly 50 per cent. reacted positively.

THE BACTERIOLOGICAL LABORATORY, KINGSTON, JAMAICA.

H. Catto, Acting Bacteriologist, Kingston, Jamaica, gives reasons for regarding the long vexed question as to the nature of vomiting sickness in Jamaica as definitely settled by the investigations of Dr. Scott* :—

"1. The term 'Vomiting Sickness' has been for many years used as a comprehensive name for various diseases, including cerebro-spinalmeningitis, gastritis, gastro-enteritis, worms, malaria, in fact, practically any disease occurring in the cooler months and associated with vomiting and convulsions.

"2. During the last ten years opinions have been expressed to the effect that there is an affection called vomiting sickness whose course of symptoms and post-mortem changes are not those of any known disease.

"3. The death-rate from this affection is exceedingly high, 80 per cent. to 90 per cent. and a fatal termination occurs in a few hours.

"4. The first systematic investigation into the affection was undertaken by Captain (now Major) T. J. Potter, R.A.M.C., who came to the conclusion 'that the majority of deaths ascribed to the so-called vomiting sickness are due to 'Yellow Fever' (1911).

"5. To this succeeded the 'Meningitis era,' a recrudescence of the older idea that some cases at all events included under the term 'vomiting sickness' died from cerebro-spinal meningitis.

"6. Seidelin's investigation took place the following year (1913), but, though he was the first to give a detailed description of the morbid anatomy, he did not succeed in solving the question of causation.

"He showed however, that there was a definite unexplained condition comprising the majority of cases reported as vomiting sickness and that the condition was neither Yellow Fever nor Cerebro-spinal Meningitis.

"7. Investigations into a typical and severe outbreak at Montego Bay in February, 1915, revealed the fact that in a majority of the cases in which a reliable history was obtainable ackees formed part of the last meal taken in health, and that this article of food could not be excluded in a single case.

"8. Persons taking 'soup' or 'pot-water' made with ackees in certain conditions showed the most acute symptoms ; the onset occurred in two hours and death nearly always resulted.

"9. 'Salt-fish,' a frequent article of diet, is in the country parts used as a euphemism for 'salt and ackee.'

"10. Ackees under certain conditions are undoubtedly poisonous ; among such conditions are : (i) unopened ackees ; (ii) ackees picked from a decayed, bruised or broken branch ; (iii) ackees which have not opened naturally, but which have been forced open ; (iv) ackees with a soft spot in an otherwise apparently sound fruit.

"11. Much of the poison is extracted by boiling with water." . . . .

"19. Micro-organisms are rarely found in true vomiting sickness cases, and, when present are probably accidental and have no pathological significance.

"20. Intragastric administration of an extract made by boiling unopened ackees with water produced in three kittens and one pup the symptoms and pathological changes seen in cases of vomiting sickness.

"21. A case of ackee poisoning in a human subject exhibited the same symptoms, course, and post-mortem changes, macroscopical and microscopical, as (*a*) Human vomiting sickness cases, and (*b*) Animals to whom an aqueous extract of unopened ackees had been administered.

"22. The characteristics of vomiting sickness, viz :—(i) Peculiar seasonal prevalence ; (ii) its confinement to Jamaica, so far as is known ; (iii) the sudden onset of symptoms in apparent good health, and in the well-nourished as in the emaciated ; (iv) the rapid and complete recovery of non-fatal cases ; (v) the affection of several members in one house or close neighbours in a settlement; (vi) the vastly greater preponderance in children; (vii) the absence of preference as regards sex; (viii) the rarity of occurrence in white children and in East Indians; (ix) the pathological changes induced; all find explanation in the view that the condition is an acute intoxication by unopened or unwholesome ackees—the fruit of Blighia Sapida."

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* Jamaica : Annual Report of the Superintending Medical Officer for the Year ended 31st March, 1916, pp. 46–47. Jamaica : Government Printing Office, Kingston.

The same authority refers to a form of polyneuritis which is found in Jamaica. He states:—

"I do not propose to give a description of the clinical signs and symptoms which are well known to all practitioners in Jamaica, but the opinion which I was able to form from my observations was that the condition at first sight appeared to be a multiple Peripheral Neuritis attacking chiefly the nerves of the lower extremities, but capable also of involving cranial and other nerves. It is obvious that those diseases which are known to be associated with a Polyneuritis, especially those occurring in the Tropics, would have to be eliminated before one can conclude that one is dealing with a definite clinical entity. . . . "

"In the Tropics, it is customary when a cause for a Peripheral Neuritis cannot be found, to attribute it to either Malaria or Syphilis. In order therefore to ascertain whether Malaria could be an aetiological factor, I examined the blood of each patient and the results are recorded in a table at the end of this report. No parasites were seen; there was no pigmentation of the leucocytes, no relative increase of the large mononuclears while evidences of anaemia such as nucleation and low haemoglobin content of the red blood corpuscles, polychromasia, basophilia, etc., were not encountered. Neither could any enlargement of the spleen be made out. In fact I could not convince myself that Chronic Malaria was in any way responsible for the Neuritis. It certainly was not associated with it. Similarly to eliminate an active syphilitic infection, a Wassermann test was carried out on the blood of each patient, and with one exception—viz., the case of (Ezekiel Douglas) who admitted that he had had Yaws when a boy, and who in addition had peculiar scars on both feet—all of the cases reacted negatively. . . ."

"It may not be amiss here to draw attention to an article by Dr. Percy Ashburn published in the proceedings of the Medical Association of the Isthmian Canal Zone, for the half-year October, 1914–March, 1915, in which he describes a form of Peripheral Neuritis, attacking youths and adults, endemic in Panama, frequently associated with Malaria and clinically indistinguishable from Beriberi, but occurring in persons who eat largely of beans, meat and fresh vegetables, and in many instances apparently independent of diet. Whether this Neuritis is the same as the one met with in Jamaica or even whether it is at all related to it, it is at present difficult to say, as a pathology in the two conditions has not yet been satisfactorily worked out. Meanwhile his remarks that decreasing wind and increasing rainfall bear a time relationship to the rise of the disease, while the occurrence of stegomyia mosquitoes and of house flies may bear a place relationship, suggest that he recognizes the possibility of a micro-organism being the etiological factor." [p. 48–49.]

TRINIDAD AND TOBAGO.

Surgeon-General H. L. CLARE in his Medical Report for 1915 gives in concise form considerable information as to medical and sanitary conditions in the colony*:—

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* Trinidad and Tobago. Medical Report of the Surgeon-General for the Nine Months ended the 31st December, 1915. Council Paoer No. 133 of 1916, p. 6.

"The population of the Colony estimated by the Registrar-General to the middle of the nine months' period ended 31st December 1915, is 361,811 and on this estimate the following birth and death-rates for the nine months are computed :—

Birth-rate	31·52	
Death-rate (Crude)	21·26	
Natural increase of population (registered births over deaths)		2,796
Number of deaths of children under one year ..		1,334
Number of still births registered		701
Infant mortality rate	155·28	

"The principal causes of Death are shown in the following Table which also displays the death-rate from each cause per 1,000 living :—

Cause of Death.	*Number.*	*Death-rate per 1,000 living.*
Malaria	479	1·73
Tuberculosis (all forms)	412	1·5
,, Pulmonary	371	1·36
Bronchitis and Broncho-Pneumonia ..	359	1·32
Pneumonia	180	0·66
Cardiac Diseases	172	0·63
Dysentery	361	1·32
Diarrhoea and Enteritis	710	2·6
Enteric Fever	121	0·44
Ankylostomiasis	159	0·58
Old Age	309	1·13

"The general health of the Colony as disclosed by the reports of the District Medical Officer was on the whole satisfactory, with some excess of malaria in certain districts which is attributed to increased rainfall in the latter part of the period. With the exception of four District Medical Officers who record a few cases of the Malignant type of Malaria all the others report the disease to be of the mild or benign tertian variety. There was no unusual prevalence of endemic disease with the exception of small outbreaks of dysentery in the Bocas and Arima Districts which were soon controlled ; in the Colony generally there was a decrease in the usual incidence of dysentery which also was of a less virulent form. Enteric fever prevails in an increasing degree nearly all over the Colony ; there were 160 cases and 121 deaths (a very high proportion) brought to notice within the nine months yielding a death-rate of 0·4 per 1,000 living. This disease remains unnotifiable, and the observations under this head in my Annual Report for 1914–15 apply again with increased force. The Colony was happily free from any case of Plague or Yellow Fever during the nine months. I regret to say that there is no change to record in the Tuberculosis situation in the Colony.

"The campaign against Ankylostomiasis is still pursued with vigour and achieves I think excellent and permanent success ; monthly progress reports of the operations have been submitted regularly."

ST. VINCENT.

In the Annual Report for 1914–15, the medical officer No. 4 District, St. Vincent, states that, compared with the preceding year, the birth-rate had diminished 15 per cent., and that the death-rate had increased nearly 50 per cent.

As regards general sanitary conditions, he holds that "the villages in the district have been periodically kept clean. Nothing untoward seems to have arisen to give rise to extraordinary sanitary measures." He, however, makes the following remarks on syphilis and tuberculosis, as causes of mortality*:—

> "*Syphilis* contributed 23 per cent. towards the total mortality for the year, and *infantile diarrhoea* claimed 22 per cent. of the victims. These two affections apparently work hand and hand and between them account for no less than 45 per cent. of the number of deaths recorded for the year. Congenital syphilis enjoys a high rate of incidence among the children of this district. The trouble is aggravated by ignorance and negligence on the part of the parents, injudicious feeding and internal parasites. The infants of this district come into the world to combat a series of evils which work their way among these helpless beings with unrelenting vigour. Not less than 75 per cent. of the children from 3 to 10 years of age, who appear at the dispensary, presumably for worm powders, bear the impress of the strange and stern discipline which they have had to undergo, in making a fair bid for life. The lymphatic glands in the groin, neck and epitrochear regions, which remain discrete and in a chronic state of enlargement bear testimony to the winners of the race in the desperate struggle for survival. The high infantile mortality shows the heavy toll which is paid in this strife. . . .
>
> "*Pulmonary Tuberculosis.* 31 cases and 12 deaths are on record for the year, a mortality of about 40 per cent. It is regrettable that Tuberculosis is a disease destined to spread among the poorer classes. Tit-bits prepared to fillip the appetite of the dying are passed on, tasted and inoculated, to the less fortunate members of the household. Bedding and wearing apparel, far from being consumed in some devouring flame, are coveted as an heritage. Such is the gloomy picture which confronts the student of preventive medicine in these damp, stuffy, overcrowded, ill-ventilated rooms with their low thatched ceilings."

The Report on the Kingstown Colonial Hospital for the same period, by Dr. Cyril H. DURANT, gives further testimony to the important place syphilis holds as a mortality factor on the island. Of a total of 970 admissions of in-patients 14 per cent. were due to syphilis. There were four deaths due to this disease. In addition, in the out-patient department, there were 126 cases of the tertiary form treated with nine deaths.

PANAMA CANAL ZONE.

With victory gained in Panama, Surgeon-General GORGAS' successors must still be on the watch that retrogression does not occur. The Report of the Department of Health of the Panama Canal for the month of September, 1916, shows that there has been continuous progress. In a strength 33,528, the constantly non-effective rate per mille was 8·88, as compared with 10·35 for the corresponding month of the preceding year. Under malaria, the admission rate for both hospitals and quarters was 13·95, as compared with 53·41 for September 1916.

The following note records practical observations of value:—

> "The several districts of the zone are in good sanitary condition, and the beneficial results of the permanent work—consisting of concreting

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*Saint Vincent: Report of the Medical Officer, Kingstown, for the Year 1914-15. p. 18.

ditches and installing tile drains—during the past dry season is manifest. The heavy rains have made it possible to determine where additional drains are required and the laying of tile is in progress in all the districts. Hydraulic fills are being made at Paraiso, and in the flats between Ancon and Corozal.

" The hydraulic fill immediately north of the Balboa railroad station, which was made two years ago, has given very little trouble from breeding mosquitoes until recently. Experience of past years has been repeated in connection with this fill; with the appearance of vegetation of the fill, both culex and anopheles have been found and the area now requires careful attention.

" As noted under ' Vital Statistics,' the malaria rate has been reduced about one-half as compared with last year.

" A number of cases of dengue have appeared at the military posts on the west side of the canal. In connection with the transmission of dengue by *Culex fatigans*, it is interesting to note in this connection the following figures showing the number of mosquitoes caught in barracks at the several posts during the month.

	Culex caught.	Total number caught.
Camp Otis	37	5,992
Camp at Empire	4	743
Camp Gaillard	29	4,903

" The number of anopheles caught are in all cases less than the number of culex, and almost the entire catch at all of these posts consist of mansonia. If the continued appearance of cases of dengue in this vicinity affords an opportunity to do so, it is proposed to take steps to determine whether mansonia are transmitting dengue." [p. 10.]

YQUITOS, PERU.

*The town of Yquitos, on the River Amazon, is in Peruvian territory, and is the natural terminus of the most important steamer traffic on that river. It is a town of about 12,000 inhabitants, and until the year 1912 was in the most deplorable sanitary condition; the annual mortality amounting to 40 per thousand. Within the last four years, however, the sanitation of the town has been energetically taken in hand by the Prefect, Colonel PUENTE, and his sanitary adviser, Dr. CONVERSE, the latter a United States graduate, and a pupil of General GORGAS of Panama fame. The result has been that within a year the mortality, for 1913, dropped to 28·88 per thousand, and, for the first six months of 1914, to 21 per thousand. The principal diseases to be combated were yellow fever, malaria, ankylostomiasis, beriberi, liver complaints and disorders of the alimentary canal. The town was full of the usual open drains, into which the inhabitants emptied their rubbish, while the habit of relieving the calls of nature out of doors, wherever there was the concealment of vegetation, polluted the whole soil. Energetic measures of the usual kind were taken to destroy the

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*ROMÉRO (Oscar Luiz). Saneamento de Yquitos. [Sanitary Improvements at Yquitos.]—*Brazil Med.*, 1916, Jan. 22, Vol. 30, No. 4, pp. 28-31. Summarised by Dr. J. B. NIAS.

breeding places of mosquitoes, principally Stegomyia and Mansonia, and a systematic plan for canalizing the drains of the whole town was simultaneously put in hand. Unfortunately, the water-supply for domestic purposes in Yquitos, up to the present, seems to consist exclusively of rainwater, which has to be collected in the usual receptacles, with all their attendant dangers. The work of improvement, however, is still in progress, according to the writer of the present paper.

THE INFLUENCE OF VENTILATION AND HEATING OF ROOMS ON HEALTH.

According to the first Report issued by the New York State Commission on Ventilation* the following results have, so far, been obtained. As the Commission has not finished its work, their conclusions may in future require modification.

" 1. A very high room temperature such as 86° F. with 80 per cent. relative humidity, produces slight, but distinct elevation of body temperature, an increase in reclining heart rate, an increase in the excess of standing over reclining heart rate, a very slight lowering of systolic blood pressure, and a marked fall in the Crampton value.

" 2. A moderately high room temperature, 75° with 50 per cent. relative humidity, has all the effects noted above although of course in less degree than the extreme temperature condition.

" 3. Even the extreme room temperature of 86° with 80 per cent. relative humidity shows no effect upon rate of respiration, dead space in the lungs, acidosis of the blood, dissociation of oxyhaemoglobin, respiratory quotient, rate of heat production. rate of digestion, carbohydrate or protein metabolism, concentration of the urine and skin sensitivity.

" 4. The power to do either mental or physical work, measured by the quantity and quality of the product by subjects doing their utmost. is not at all diminished by a room temperature of 86° with 80 per cent. relative humidity.

" 5. On the other hand the inclination to do physical work, and the inclination to do mental work are diminished by sufficiently high room temperatures. So far as physical work is concerned our tests show a decrease in actual work performed, when the subject had a choice between working or not working, of 15 per cent. under the 75° condition and of 37 per cent. under the 86° condition, as compared in each case with 68°.

" 6. Stagnant air at the same temperature as fresh air, even when it contains 20 or more parts of carbon dioxide and all the organic and other substances in the breathed air of occupied rooms, has, so far, shown no effect on any of the physiological responses listed above under 1 and 3 nor on the power or inclination to do physical or mental work nor on the sensations of comfort of the subjects breathing it.

" 7. On the other hand the appetite for food of subjects exposed to such stagnant air may be slightly reduced.

" 8. These experiments seem to indicate that overheated rooms are not only uncomfortable but produce well-marked effects upon the heat regulating and circulatory systems of the body and materially reduce the inclination of occupants to do physical work. The most important effects of ' bad air ' are due to its high temperature, and the effects of even a slightly elevated room temperature such as 75° are sufficiently clear and important to warrant careful precautions against over-heating.

" 9. The chemical changes in the breathed air of occupied rooms are of comparatively minor importance although the substances present in such air may exert a slight decrease in the appetite for food."

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* American Journal of Public Health, 1915, Feb., Vol. 5, No. 2, pp. 85–118.

DISEASE PREVENTION.

MALARIA.

Anti-Malaria Measures in British Guiana.

The Report of the Surgeon-General for 1915 gives proof of the financial saving in labour and the saving of life following routine sanitary measures. Surgeon-General WISE states:—

" Efforts have been made to introduce the systematic use of quinine into the schools. This measure is now adopted in 95 schools. The total number of schools in the colony is about 230 in number.

" Specially malarious districts have been selected for this distribution in preference to others. Both Managers and Head Teachers have frequently given expression to the obvious benefit which results.

" Much has been done on sugar estates towards eliminating the periodic epidemic of malaria. These measures consist mainly in careful drainage in the yards with constant prophylactic use of quinine supplied free for the labourers. This excellent work is however limited to the yards proper and does not extend to the pasture lands which are gradually increasing in population, and in which occur the greater number of malarial deaths on the estates.

" This table shows the spleen rate of children on the estates in various districts since 1911. [pp. 18-19.]

(1) Districts.	(2) 1911.	(3) 1912.	(4) 1913.	(5) 1914.	(6) 1915.
Demerara :—					
East Bank	13	7	4	7	5
West Bank	39	25	18	12	15
East Coast	18	5	5	5	9
West Coast..	24	9	4	4	9
Berbice :—					
Canje	20	..	7	2	3
East Bank	42	33	24	9	10
Corentyne	10	2	1	..	1
West Bank and West Coast	26	11	6	2	2
Essequebo	47	15	10	6	7

" The number of deaths from malaria in Estates' hospitals is as follows :—

1906–07 to 1910–11 per year	210
1911–1912	167
1912–1913	66
1913–1914	60
1914–1915	65
1915 (nine months)	78 "

" The prophylactic use of quinine has produced a marked improvement in the incidence of Malaria Fever.

Year.	Cases.
1909-10	241
1910-11	113
1911–12	52
1912–13	25
1913–14	25
1914–15	42
1915 (nine months)	6

" These six cases which were all mild ones were treated in hospital." [p. 9.]

Anti-Malarial Drainage in India.

The Indian Irrigation Committee* has placed on record that India, in the past, appreciated the necessity of drainage as an anti-malarial measure. In discussing conditions in the United Provinces of Agra and Oudh, it is stated:—

> "It cannot however be said that the canals in the United Provinces have always conferred unmixed benefits upon every tract which they command. In many places, their introduction led to a gradual but steady rise of the level of the subsoil water, and resulted eventually in water-logging of the soil, the increase of malaria, and the further deterioration of *usar* or *reh* covered tracts. To remedy these evils and to prevent further injury, it was found necessary to incur a considerable outlay on the re-alignment of some of the older channels, and on the construction of a large system of drainage channels, the aggregate length of which now amounts to 3,327 miles, or to more than one-third of the total length of the canals and their distributory channels. On the construction of the drains an expenditure of about 43 lakhs† has been incurred. These measures have gone far to remedy, if they have not entirely removed, the evils of which there were various complaints in past years."

Malaria and Irrigation.

One of the most baneful errors of the uneducated tropical agriculturist is that the more water he is able, by means fair or dubious, to secure for his land the better will be the crop. Under this method, the aeration of soil and deterioration of crops is involved; puddles and, with them, the chances of suitable breeding places for anophelines being increased, the natural sequel is malaria with its deteriorating influence on the agriculturist. A vicious circle is formed.

In finding a happy mean between wasteful and useful employment of water, the Agricultural Research Institute of Pusa continues to do work that is destined to be of vast importance in the agricultural, financial and sanitary interests of India, and the Tropics generally. The following is from a Review of the Report of that Institute for 1915 and 16 by "Indian Engineering (Calcutta)."‡

> "In connection with the growing of wheat in India a question of the very first importance is being investigated at Quetta; and this is if it cannot be matured with a greatly reduced supply of irrigation water. Experiments have already established the following five principles:—(1) The irrigation water available must be spread over the largest possible area; (2) heavy waterings reduce the proportion of grain to total crop; (3) the growth period of wheat is increased by heavy waterings; (4) when the water supply is limited, the root development of the wheat crop must be deep; (5) the soil moisture must be preserved, as far as possible, by a surface mulch of dry soil. By advice of the officers of the Experiment Station Zemindars have, by giving only a single watering before sowing instead of six waterings after sowing as was their practice, been able to produce over 22½ maunds of grain (in addition to 43½ maunds of bhusa) per acre instead of their former average of 13 maunds. Should this principle prove to be of general application the saving of irrigation water in the wheat tracts of India will be enormous; there will moreover be a general improvement of the soil, less water logging and less fever."

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* p. 185. Part I to IV.

† One lakh = £6,666.

‡ Indian Engineering (Calcutta), 1916, Nov. 18, Vol. 60, No. 21, p. 323.

The Sympathy of Agriculture with Anti-Malaria Interests.

That water logging of soil should no more be tolerated in the agricultural than in the anti-malarial interests of an area is evident from the following extract from "Soil Erosion and Surface Drainage," by Albert Howard, C.I.E., M.A., Imperial Economic Botanist.*

"Many of the soils of the Indio-Gangetic plain belong to the category of silt-like soils and are particularly liable to the destruction of their porosity by heavy rainfall or surface flooding. The pore spaces of the soil become filled with water, air is expelled and the particles slip into a position of closer packing. . . .

"The occurrence of slight water-logging can only be detected by a trained observer, who has learnt how to read his practice in the plant. The production of swamps, on the other hand, is of course obvious to all, but between these two extremes a vast amount of damage to crop production is being done every year which is only very dimly understood at the present time.

"One of the best methods of detecting the occurrence of water-logging is a close observation of the growing crop. One of the first things to be noticed, in cases where the porosity of the soil has been destroyed, is a slowing down in growth and the production of yellowish foliage. This is often exceedingly unhealthy in appearance, and, if the roots are entirely deprived of air, as is sometimes the case during the monsoon, a diseased condition, described as wilt, ensues and the plants finally die outright. . . . The foliage is thin and yellow, the growth poor and the root system badly developed and near the surface. Such crops never stand the advent of the hot season but dry up quickly, although there is abundant moisture in the subsoil. They starve in the midst of plenty, on account of the fact that they do not root deeply, and therefore cannot make use of the subsoil moisture. This result follows from the want of aeration in the subsoil of such water-logged lands and to the fact that the roots cannot breathe for want of a proper supply of oxygen gas.

"The damage done to crops by water-logging seems to be due to two main causes—lack of aeration and the destruction of nitrates. If the soil is not ventilated properly, a full supply of oxygen does not find its way into the ground for the use of the roots and soil organisms and the carbon dioxide, which is formed in the soil in large quantities, cannot escape into the atmosphere. The result is that crop production is limited—directly by the want of air and indirectly by the inhibiting effect of the accumulation of carbon dioxide. Besides these effects, water-logging, if continued for some time, leads to the destruction of available nitrogen in the soil."

St. Vincent.

Dr. C. A. Hughes, Medical Officer, No. 2 District, Kingstown, considers that "a very important factor influencing the comparative scarcity of the disease (malaria) in St. Vincent is the porosity of the soil. This with improved sanitary inspection and an increased area of cultivated land is responsible for the fewer cases met with."†

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* Agricultural Research Institute, Pusa, Bulletin No. 53, 1915, pp. 7 & 8.

† St. Vincent. Report on the Colonial Hospital for the Year 1913–14.

Malaria in Sanitary Administration.

The *Transactions of the Society of Tropical Medicine and Hygiene* for the month of November, 1916 (Vol. 10, No. 1, pp. 1–15) contained an article by Dr. MACDONALD of a sound practical nature, on the principles which should be followed in sanitary organization in the Tropics. To this is added a discussion of methods of malaria eradication.

In respect to organization he states:—

> "The staff of the health department in its simplest should consist of a Medical Officer of Health specially trained in practical sanitation, holding a degree in science or a diploma in public health, and of necessity in the tropics holding also a diploma in tropical medicine; sanitary inspectors, clerical staff, and labourers.
>
> "The number of Sanitary Inspectors depends on the population. For a unit—rural or urban—of 60,000 population, ten sanitary inspectors is a reasonable number. This population represents some 10,000 (urban) to 12,000 (rural) dwellings, and with ten inspectors it should be possible for each premises to be visited and reported on in routine once every three months, or four times a year.
>
> "I contend that the value of all public health administration is to be summed up in its domestic inspection and education; and, to get any control over that, the routine visitation is an absolute essential." . . .
>
> "Of the ten sanitary inspectors the health officer will select his men for duties in which they display special aptitude. In general it will probably be found best simply to give them districts in which they have the entire control of all sanitary measures, and to select men for special duty as occasion dictates.
>
> "A superior inspector may be chosen as a chief sanitary inspector specially trained or not, but the health officer in any case, if he desires work done, will have to go down to his inspectors individually, go over their records with them, and systematically review their work in the field. *Sic itur ad astra*—only thus. If the health officer expects to control the disease conditions in a tropical community only by plotting curves and pulling strings at his office desk, he had better not attempt work in the tropics. He must see things done." . . .
>
> "A labouring staff is inevitable in a tropical health department. In the city the scavenging rightly is an important section of the health department. The necessary carts, horses, mules, motor-vans, and all the paraphernalia of tropical scavenging will come under the direct purview of the health office. The manner of their economic engagement will be a matter for the interested authority. Their entire control during working hours will be under the medical officer." . . .
>
> "On the labourer, strange as it may seem, depends the value of the ordinary antimalarial measures in an urban or rural tropical community. An average of a labourer per mile of streets, lanes, gullies and roads may be set down as a fair indication of the necessities of scavenging, street cleaning, gully training, gutter sweeping, and the various odds and ends of practical sanitation in a city. On the co-operation of the whole population depends the value of special antimosquito work, the suppression of Culex and Stegomyia, and sometimes of Anopheles.
>
> "In a purely rural community, outside towns, organised control of roadside gutters and other temporary breeding pools may be obtained by having a labourer roughly to five miles of roadway."

After inviting attention to the recognized anti-malaria measures, he suggests "inquiry into the gross relativity between the quinine consumed in any community and the incidence of blackwater fever." But in respect to quinine he holds

> "that *quinine has no position in sanitary administration*; and I *contend that the facile relief from malaria attacks by the taking of quinine, the consequent apotheosis of quinine in the hands of the medical officer and in the*

minds of the people, the easy glory of cheap quinine administration by governments, have disastrously postponed sanitary administration in the tropics, and prolonged personal misery and economic inefficiency." [Italics in original.]

Larvicides.

The Report of the Agricultural Research Institute and College at Pusa (p. 76) during 1914–15 describes the following experiments as to larvicides :—

"With a view to determining the influence of local waters on mosquito-breeding, experiments were made on the effect of equimolecular salt solutions on the larvae. The results were of interest as indicating that an unexpectedly high percentage of lime in water is to some species distinctly beneficial."

BLACKWATER FEVER.

The following observations as to blackwater fever would support the opinion that whether this be but an aggravated form of malarial fever or a separate entity, at least it falls in frequency before the advance of anti-malarial measures* :—

"There can be no question but that the greater attention now devoted to malaria prophylaxis accounts for this comparatively low incidence of blackwater fever, the average liability to which among Europeans is now about 1 per cent.

"Just 20 years ago Sir Harry Johnston appended the following note to the Annual Medical Report of the Protectorate, which is of much interest in this connection :—

"'The death-rate amongst Europeans rose from a former death-rate of 6·5 per cent. to 9·7 per cent. The number of deaths registered was 28, out of an average European population of 275.

"Of these deaths 20 were due to the various forms of malarial fever (including blackwater). . . . Out of the 20 deaths from malarial fever about 16 were cases of blackwater. Besides these 16 cases there were as many more where recovery took place.'

"So that in the year 1895 there were about 32 cases of blackwater fever in a population of 275, making the liability about 11·6 per cent. fifteen years ago."

The following extracts from the Annual Medical and Sanitary Report for Nigeria 1914 support the same opinion :—

"*Decline in number of cases and its cause.*—Whatever the cause of the steady decline in the number of blackwater fever cases with its heavy case mortality (25 per cent. in Europeans and 50 per cent. in natives in 1914), it is very gratifying to record that, like malaria, rapid progress is being made in its reduction.

"There can be little doubt that the dissemination of useful information to the layman as to how he should live on the Coast, the more regular use of quinine, and the general improvement in the sanitary condition of stations have largely contributed to the decline." . . . [p. 69.]

"It is interesting to note that of six blood films, examined at Yaba, three of which were taken during the first twenty-four hours of the disease, malaria parasites were found in all three. Of films examined which were taken later than the first day parasites were not found ; strong support for the contention of many authorities that malaria parasites can be found in all cases of blackwater fever during the first twenty-four hours if an exhaustive search is made for them. A thorough examination of the cases is often, however, not possible for the Medical Officer in the bush, where many cases occur, and he does not always have the opportunity of seeing the case during the first twenty-four hours." [p. 94.]

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* Nyasaland Protectorate. Annual Medical Report on the Health and Sanitary Condition for the Year ended 31st December, 1914, p. 12.

SLEEPING SICKNESS.

Precautionary measures against trypanosomiasis as carried out during 1915 are thus described in the Annual Medical and Sanitary Report for Nigeria, by Dr. M. Cameron BLAIR, the Senior Sanitary Officer:—

"During the rainy season the fronts of many of the riparian villages in the Province of Muri were kept entirely cleared; and the danger of the villagers being attended by tsetse-flies, during their movements to and from the necessary water, was thus materially diminished. The opening up of trunk roads and the maintenance of existing ones, mentioned above, was very substantial progress, considering the narrowness of the means, financial and personal, available for the purpose. In this connection, the work maintained in the backward provinces of Bassa and of Muri is especially worthy of mention. . . .

"No case of this disease was recorded in a European during the year, although the river Benue had been used extensively for passenger transport. One of the European victims, reported the previous year, returned to duty convalescent.

"The vessels used for passenger transport were all fitted with more or less effective wire gauze shelters. . . .

"Clearing operations are always being effected in tsetse belts, so far as funds and other means will allow; where there are alternative routes, the use of those traversing fly-belts is consistently discouraged; constant efforts—increasingly successful—are being made to induce Natives permanently to desert foci of sleeping sickness; and Government is gradually adopting the policy of refusing to permit Europeans to settle in regions from which it is trying to induce the indigenous natives to depart.

"But it must be remembered that operations against trypanosomiasis are a constant war, in which the enemy is apt, unexpectedly, to change his venue from time to time." [pp. 11, 14, 15.]

YAWS.

Dr. J. M. G. EWING, Medical Officer, District No. 1, Kingstown, St. Vincent, considers that more sanitary effort is necessary in the suppression of yaws. He states*:—

"Recurrences or fresh infections do occur after treatment by "606," and it is now recognised that salvarsan is not the infallible remedy it was, like every new drug, at one time claimed to be; still the results are, I think, excellent, and it is the best drug we can employ.

"Hospital treatment is however, not sufficient; infected houses ought to be purified to prevent the spread of the disease, and cured patients ought to be able to return to clean homes. The infected houses ought to be fumigated, and if funds were available, every case of Yaws should be reported to the Sanitary Authority, the Medical Officer receiving a fee for the notification; old clothing and articles of little or no value should be burned, and if not, fumigated, the house at least ought to be whitewashed, and scrubbed, and purified in a domestic manner.

"In this way we might hope to eradicate the disease entirely in time."

* St. Vincent. Report on the Colonial Hospital for the Year 1913-14.

VENEREAL DISEASE.

To meet the requirement of not breaking a day's labour to secure medical treatment, is certainly a desideratum of great import in prevention of spread of venereal disease. This highly practical point has been met in New South Wales by the opening of so-called "night clinics." The Director-General of Public Health (Dr. Robert PATON) in his Rport for 1914 thus describes their *raison d'être* :—

"During the last two or three years more than usual attention has been devoted here to the subject of venereal diseases with the object of making available adequate and easily accessible avenues of treatment, as it is more and more realised that this is the only method by which persons affected can themselves be secured from the more disastrous effects of these diseases, and other persons be protected from contracting infection.

"The first Night Clinic was opened at the Department's Hospital Admission Depôt in July, 1914, and did excellent work ; one night a week being devoted to men and another to women patients.

"Later on a Night Clinic for venereal diseases was opened at the Royal Prince Alfred Hospital, where greater facilities for treatment could be provided. This clinic proved a remarkable success in dealing with the disease, the number of persons treated amply demonstrating the absolute necessity which existed for taking special steps in this direction. The attendances at this clinic exceeded those of any other out-patient department at the hospital." [pp. 7 and 8.]

YELLOW FEVER.

The following Resolution appeared in the Calcutta Gazette on the 23rd November, 1916 :—

"The question of the measures to be taken to prevent the introduction of yellow fever into the Port of Calcutta through the medium of the stegomyia mosquito in consequence of the opening of the Panama Canal has recently been under the consideration of Government. The Government of Bengal are advised that an essential preliminary to any scheme of anti-stegomyia work is to secure effective sanitary organization in the Port area. At present there are a number of independent authorities having sanitary jurisdiction in the Port area, whereas it appears desirable that measures for the reduction of the stegomyia mosquito should be under the supervision of one controlling authority. It also appears that the legal powers of these bodies in respect of sanitation are insufficient for the measures required for an anti-stegomyia campaign.

"In these circumstances the Governor in Council has decided, on the recommendation of the Sanitary Commissioner, to convene a conference representing the different bodies concerned to consider the measures necessary to establish homogeneous sanitary control throughout the Port area, with special reference to the action which should be taken to ensure the security of the Port from yellow fever. The conference will be constituted as follows :—

"Chairman :—Mr. C. J. Stevenson-Moore, C.V.O., I.C.S.

"Members :—The Surgeon-General with the Government of Bengal; the Vice-Chairman, Port Commissioners ; the Chairman or a representative of the Calcutta Corporation ; the Chairman or a representative of the Howrah Municipality ; the Chairman or a representative of the Cossipore-Chitpore Municipality ; the Chairman or a representative of the Garden Reach Municipality; the Chairman or a representative of the Budge-Budge Municipality ; the Health Officer of the Calcutta Corporation ; the Port Health Officer.

"Secretary :—The Sanitary Commissioner, Bengal."

DYSENTERY.

In the Annual Medical and Sanitary Report for Nigeria for 1914, the following suggestions as to transmission of dysentery occur :—

"Sixty-six Europeans and 747 natives were treated for this disease, and 130 of the natives died.

> "These figures show a very material increase on those of the previous year.
>
> "It is easy to account for the increase among the natives. The native cases were largely drawn from labour camps, where the sufferers were brought under medical notice; while until the harvest had been gathered in and normal plenty had thus been restored after the scarcity mentioned above, many suffering and starving natives had been aggravating their intestinal ailments by eating crude raw grain.
>
> "It is difficult to explain the increase among the Europeans; but it is a fair inference that, when an increase of native cases occurs, infection must be more widely disseminated. Now Europeans eat salads; when infection is more widely disseminated, salads are more liable to be dangerous; and there can be little doubt that the majority of Europeans affected acquire the infection from this source. This renders attempts at stamping out the disease, among Europeans, rather hopeless; for, as mentioned in a former report, to ask the average Englishman to give up salads is to ask too much of his form of human nature.
>
> "All available care is taken to safeguard water supplies, and education touching water-borne diseases is continually offered to the natives—successfully in some cases only." [p. 20.]

Under the favourable conditions of food scarcity the opportunities of spread of dysentery are so great, and the susceptibility of subjects so increased that the term "famine dysentery" is familiar, as describing e mixed conditions resulting. Doubtless in referring to "education touching water-borne diseases" amongst natives, the reporting officer does not imply that more than one of the causes of transmission could thus be met; but his reference to the Englishman's determination to eat salads in the tropics (presumably of other than absolutely known origin) would point to both education and common prudence being deficient in the white man who offers to first remove the mote from his coloured neighbour's eye. As a saving point in such supposition, however, it is to be noted that the water-borne origin of dysentery is supported in the case of Europeans, by the statement that the "large percentage were men constantly travelling and consequently unable to obtain always a supply of the sterilized water obtainable at the majority of the larger stations." If this be the cause, one must imagine the climate is exceedingly enervating. The boiling of water is not a difficult act, and actual "sterilization" need not be required to get rid of ordinary water-borne diseases.

PLAGUE.

Rats and Plague.

In Part II. of the New South Wales Report for 1914, the following is an extract from a contribution "Researches on Plague," by Drs. J. B. CLELAND and E. W. FERGUSON.

> "In the first epidemic of plague at Sydney in 1900 and 1902 no record was kept of the actual number of each of the two species of rats—*Mus decumanus* and *Mus rattus*—prevalent, but in the whole collection of 215,286 destroyed there were about as many of one as of the other. *Mus rattus* predominated among those taken along the shores, and *Mus decumanus* among those taken inland. Among those selected for examination the infected specimens were all *Mus decumanus*." [p. 175.]

A total of 82,000 rats was examined for plague infection between 1903 and 1914. Of these 30·31 per cent. were identified as *M. decumanus* and 34·22 as *M. rattus*. The figures in the following Table, showing the relative percentage infected of the two species of rats at different periods should be of interest to epidemiologists.

Year.	Period of Rat Examination.	Percentage of infected to total Examined.		
		Decumanus.	*Rattus.*	*Musculus.*
1903 ..	1st May to 15th Aug.	..	..	..
1904 ..	1st Mar. to 3rd Dec.	·76	1·16	0·26
1905 ..	Year	·79	·88	·13
1906 ..	„	·49	1·02	·34
1907 ..	„	·66	1·3	·15
1908 ..	„	1·075	·84	·14
1909 ..	„	·32	1·22	2·06
1910 ..	„	·07	·009	..
		·64	0·88	·19

The Rat and Plague Spread.

In the Annual Report (Jamaica) of the Superintending Medical Officer for 1916, J. Errington Ker, the Chairman, Quarantine Board, draws attention to an interesting instance of a long travelled plague carrier* :—

"The following extract is taken from the United States Public Health Report, Volume 31, Number 19, May 12th, 1916, and is worth recording :—

Louisiana, New Orleans, Plague eradication.
Plague Rat.
Case No. 287.
Address S. S. Trevelyan from Karachi, India and Newcastle, England.
Captured April 7th, 1916.
Diagnosis confirmed April 22nd, 1916.
Treatment of ship—Deratization by fumigation.
Plague rats confirmed—1.

"(The same Health Report states that between November 7th and 20th there were two cases of human plague at Karachi and two deaths).

"From the above it would appear that the steamship Trevelyan sailed from Karachi, India, a plague-infected Port and that she called at Newcastle, where presumably she discharged and took on cargo, that she then sailed from Newcastle to New Orleans where on investigation a Plague-infected rat was found on board her. No mention is made of any human plague having occurred on board.

"This case seems to indicate firstly: that plague among rats may exist on board a ship and that the said ship may go from port to port carrying its plague-infected rats with it ; and secondly, that a ship may go a very long distance with rat plague on board, in fact may travel for several weeks in such condition without of necessity any person on board becoming infected.

"One takes it for granted that Newcastle is free from rat plague.

"One often hears it stated that it is very absurd to disinfect a ship that has come from an Indian or other port where plague exists if such ship has since leaving such above port called at an English port (possibly having discharged and taken on cargo). The above case would seem to show that one cannot be too careful with a ship that has been to a plague-infected port and which ship has not been disinfected since calling at such port, although she may have called at a port in another country since leaving the plague-infected port."

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* Jamaica. Annual Report of the Superintending Medical Officer for the Year ended 31st March, 1916. Jamaica : Government Printing Office, Kingston, p. 38.

Plague and Head-lice.

Dr. O. L. E. De **Raadt** makes the following statement* :—

"Head-lice were obtained by combing the luxuriant hair of a female plague patient; these parasites were afterwards rubbed fine in a mortar with physiological salt-solution, and with this mixture rodents were inoculated, both subcutaneously and cutaneously. By collecting the head-lice exclusively from the corpses of plague patients and not from living patients, the chances for positive results were made as great as possible, because in cases of bubonic plague, an intense bacteriaemia generally develops in the later stages of the disease." . . .

"Of five inoculation experiments, 100 per cent. were positive.

"This proves that head-lice which have sucked the blood of plague-patients, have absorbed the plague virus, and must consequently be considered capable of transmitting the disease from one person to another."†

UNDULANT FEVER.

In the Report of the Public Health Department of Malta for 1915-16, evidence of the necessity for continued vigilance as to the incidence of the disease is noted by J. Caruana **Scicluna** :—

"Concurrently with an increase in the number of goats infected with the specific micrococcus there was a recrudescence of undulant fever amongst the civil population. The number of cases notified was 473 against 321 in the preceding year, the percentage of deaths however was very small, viz., 6·3 per 100 cases. Most of the notifications referred to attacks in the urban and suburban areas; in the rural Zeitun and Tarxien were the most affected.

"In general the connection of areas yielding the greatest proportion of infection in goats with the inhabited centres where undulant fever is more prevalent is borne out year after year by the study of the incidence of the disease.

"Of 6,630 goats and 983 sheep examined 598 and 10 respectively were found infected, the proportion being 9 per cent. for goats and 1 per cent. for sheep." [p. 2.]

TYPHOID.

Jamaica.

At p. 9 of the Report of the Central Board of Health, Jamaica, 1916, Dr. Oliver **Crosswell** makes the following remarks as to the prevalence of typhoid fever in Kingston :—

"There were 48 of such notifications [cases admitted from outside the parish] for 1915, and 66 for 1914; this would reduce the cases having origin in Kingston to 205 for 1915, which would naturally materially reduce the incidence rate for Kingston proper.

"With regard to the causes of the prevalence of this disease, I have nothing to add, the matter having been exhaustively dealt with by Drs. A. MacDonald and Turton in their valuable report on Typhoid Fever in 1911. I cannot however minimise the danger from flies and foul pit closets, many of the latter being no doubt active laboratories for the breeding, growth and dissemination of the germs of the disease. It is unnecessary for me to labour the *relative connection between the fly and the pit-closet* on the one hand, and the *fly and the food of the people*, on the other hand.

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* Mededeelingen van den Burgerlijken Geneeskundigen Dienst in Nederlandsch-Indië., 1915, Vol. 4, pp. 39–40.

† Certain races kill head-lice by smashing them against the scalp of the bearer. Scratching of the head from irritation of lice is frequent.

" '*The Carrier,*' as a cause of infection, may be responsible here and there for a certain number of cases; but I do not believe that the proportion would bear any comparison with the number of cases due to fly and food infection; and this leads one up to a consideration of the advisability of using *Anti-Typhoid Inoculation* as a preventive measure, for our school children, hospital attendants, and others of the general public who would be willing to submit to inoculation. In a paper read before the Medical Officers of Health Society of Jamaica, last year, I made a suggestion that Inoculation as a preventive measure having been found to render immunity to troops inoculated against Typhoid, the measure might well be tried in the schools with the children. It is a measure that would not run into any great sum of money, and may be expected to have as great a benefit as it has proved to the troops in this campaign. It is worth a trial.

" In the United States of America it has become fashionable for large numbers of persons to voluntarily seek inoculation against Typhoid. It is estimated that in 1914 over 100,000 persons throughout the country were immunised, and it is thought that for 1915, the number will exceed 300,000. Dr. Robertson—the Health Commissioner for Chicago, in a recent health bulletin claims that if immunisation attains the general recognition that small-pox prevention has secured, Typhoid will be a rare disease by 1930. He strongly urges that the general public must be taught the value of the remedy, and the need of it."

British Guiana.

Georgetown, British Guiana, has not yet got rid of typhoid, to the danger of which to the rest of the Colony Surgeon-General WISE, some time back, called attention. The figures given in his Report for 1915 are as follows* :—

"This year there has been an increased number of notifications, and the following table shows the number each year in the whole colony since February 24th, 1912, when notification became compulsory."

(1) Year.	(2) Number of Notifications. (a) Whole Colony.	(b) City of Georgetown.
1912 March to December ..	308	160
1913	420	254
1914	265	154
1915	419	192

Anti-Typhoid Inoculation, New South Wales.

The Department of Public Health, New South Wales, has done much to popularize anti-typhoid inoculation by a free issue of the necessary vaccine. Forbes was understood to be the chief centre of typhoid infection in New South Wales. It was decided by the local medical men

"to open up with the help of the local Municipal Council a free anti-typhoid inoculation depôt at the Town Hall. Four afternoons a week were set apart for this purpose during a period of two months, beginning on 28th September, 1914, each of the four medical men of the town taking duty one afternoon a week. . . .

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* British Guiana. Report of the Surgeon-General for the Nine Months, April to December, 1915. 1916. Georgetown, Demerara: The Argosy Co., Ltd., p. 15.

"During this period a total of 2,059 people were inoculated, 1,928 receiving three doses, 70 two doses, and 60 one dose of the departmental anti-typhoid vaccine. The greatest number inoculated during one afternoon was 450. . . .

"At the present, twelve months afterwards, we were able to see the result of the campaign. . . . This shows a considerable decrease during the past season as compared with previous years, being thirty-seven below the average of the previous thirteen years, and forty-six below the average of the previous two years."

Nigeria.

The Annual Medical and Sanitary Report for Nigeria, 1915, urges the following precautionary measures :—

"It would be wise were all young men, coming out to the Northern Provinces for the first time, obliged to submit to anti-typhoid inoculation before leaving home, just as in the case of vaccination. They are the most susceptible, and, with very few exceptions, are likely to be posted to stations in the bush remote from hospitals on their first arrival.

"In the dusty, wind-swept north, a very obvious means of prevention, in addition to the routine methods, is to furnish each European with a compound sufficiently large in area to be self-contained, so far as sanitation goes, in order that the transport of latrine buckets through the station may be avoided. This is now under consideration." [p. 16.]

TUBERCULOSIS.

The Resident Medical Officer of the Lagos Hospital states* :—

"Tuberculosis is increasing and is of a most virulent type, and at Calabar there have been six deaths from this disease. Personally, I am also of opinion that the disease is extending, and other Medical Officers hold the same view.

"In Lagos special accommodation is already provided for the treatment of prisoners suffering from the affection, and a special ward could, I think, be arranged without much expense for general patients in connection with the Hospital on the Ikoyi Plains. In any case, however, the question of setting aside special wards in the large centres for cases of this disease is one which will soon become prominent."

ANKYLOSTOMIASIS.

The influence of moisture on soil, as a factor in perpetuating this disease, is thus alluded to in the Annual Report of the Fiji Medical Department for 1915 :—

"*Ankylostomiasis.*—Continues to be a disease of the wet districts, and of them the Navua medical district suffers more than any other. A considerable proportion of newly arrived Indians bring the disease with them. With these it dies down, or is in abeyance, when they are fortunate enough to be sent to a dry district, but it is bound to light up if they go to such districts as Navua or Rewa, though not to such an extent in the latter. The disease accounts for the heavy sickness rate and mortality rate in the

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*Nigeria Annual Medical and Sanitary Reports of the Northern and Southern Provinces for the year ending 31st December, 1915, p. 50.

Navua district, and has now spread to some extent amongst the native Fijians who live in the neighbourhood of the sugar plantations of this district. Measures of considerable energy continue to be taken by the medical officers in charge, with good results. The medical officer at Navua, in his health report to the Central Board of Health, reports that, of a total of 1,380 cases inspected, 718 were found to be infected—a percentage of 52·02—and that during 1915, 3,109 cases were treated at the local hospital. He reports, also, that the results of treatment have been most gratifying, and that the working capacity of the labourers has been enormously increased as a result of constant systematic inspection and treatment and improved sanitary conditions. He forms the conclusion that 40 per cent. of the Indian population of the district, including indentured and time-expired, are tainted with this infection. From this district it is also reported that, during a short period, 27 Fijians have been treated by the medical officer, besides others treated by the native medical practitioner in the hills, in the inland part of the district. The medical officer reports that his efforts, and those of his predecessors, have been well supported by the management of the local sugar plantation and the hospital attendant. It has been pointed out in a former paragraph of this report that Navua is the most unhealthy district in the Colony, and figures were given to support this statement—it may be here stated that the unhealthiness of the district is, without doubt, due in the main to the prevalence of ankylostomiasis and that the prevalence of the disease is materially assisted by the abnormally wet climate, swampy nature of the ground, and difficulties in the way of efficient drainage." [p. 6.]

SMALL-POX.

Preserved Vaccine.

In Vol. 5, No. 3 of this *Bulletin* [Sanitation Number, February 28th, 1915, p. 164] the possibility of storing animal vaccine in a refrigerator unmixed with any medium with the result of increasing the activity, as suggested by Major PATTON, I.M.S., was alluded to. The method was experimentally adopted in the Madras Presidency. Major W. A. JUSTICE, I.M.S., Sanitary Commissioner for Madras, in forwarding the "Annual Report on Vaccination in the Madras Presidency and on the work of the Vaccine Section King Institute of Preventive Medicine, Guindy, for 1915–16," states :—

"As explained by the Director in paragraph 7 of his report [the general low percentage of success] should be attributed to the new method of storing vaccine pulp in the raw condition, and grinding and mixing it with lanoline as required for issue. This having proved a failure was abandoned so soon as the unsatisfactory results became apparent." [p. 1.]

Dr. MAITLAND GIBSON, Director King Institute, makes the following remarks on the allied subject of getting rid of extraneous organisms :—

"The reduction of extraneous germs in animal vaccine without injury to the vaccine itself continues to be an unattainable ideal in India. Experiments were made to effect this by means of added preservatives and storing the vaccine in vacuo. As the organisms in vaccine are aerobic it was hoped to at least prevent multiplication in this way. Certain of the germs showed, however, that they were only facultative aerobes and could multiply quite readily in vacuo. At body temperature in vacuo vaccine showed no improved keeping quality." [p. 11.]

Surgeon-General WISE in his Medical Report for British Guiana, 1915, reports as to vaccine as follows :—

"Special lanolinated lymph from the Lister Institute, England, is now used instead of glycerinated lymph and is found more successful." [p. 21.]

The Use of Buffaloes as Vaccinifers.

Buffaloes were used in the Vaccine and Pasteur Institute at Weltevreden, in 1913, with the following results* :—

"*Quantity of vaccine produced.* During 1913, 154 buffaloes were used for the production of vaccine, in comparison with 159 in 1912, which supplied a total amount of 27,475 kg. vaccine pulp, in comparison with 19,259 kg. in 1912. On an average 178·5 grammes of pulp per buffalo was obtained, in comparison with 121·1 grammes per buffalo during the previous year. The average production per buffalo in 1913 was therefore about 57 grammes more.

"The inoculation was unsuccessful in one case; in two cases the crops were lost as the buffaloes died before the vaccine was obtained. The quantities obtained from the remaining 151 buffaloes varied from 115 grammes the least to 273 grammes the most produced per animal. In nearly all cases the lymph was taken from the animals on the fourth day; in two instances on the third and thirteen times on the fifth day."

BERIBERI.

In the Annual Report on Hospitals and Dispensaries in Burma for 1914 the Medical Superintendent, General Hospital, Rangoon, reports as follows :—

"It may not be out of place to point out how curiously limited the seasonal prevalence of beriberi is in Rangoon. Every year acute cases begin to occur in September and become rare in November, although the subacute and chronic cases are commonest then, and in January the disease stops."

At the Civil Hospital, Akyab, there were 65 cases of beriberi treated against 38 in 1913. The disease is said to be steadily increasing and is becoming a serious factor in the morbidity and mortality of Akyab town. In these cases, the majority consumed hand-milled rice and the evidence as to seasonal prevalence of the disorder is also marked, the autumn and cold weather returning the greatest number of cases.

MEASLES AND DIPHTHERIA.

Dr. J. LONG, Director of Public Health, Philippines, makes the following remarks in his Report for 1915† :—

"Although in too few cases to permit of the drawing of a conclusion with reference to the exact extent of the association, so often encountered elsewhere, between measles and diphtheria, the rough fact at least of this association has been established by systematic swabbing of all cases of measles as presumptive carriers of diphtheria.

"The special swabbing was made in 55 cases of measles during November and December with the result that five diphtheria carriers were discovered among them, which figure, for the time covered by this report, gives a percentage of 9·09. . . . "

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* Mededeelingen van den Burgerlijken Geneeskundigen Dienst in Nederlandsch-Indië 1915, Vol. 4, p. 43.

† Report of the Philippine Health Service for the Fiscal Year from Jan. 1st to Dec. 31st, 1915. 1916. Manila: Bureau of Printing, pp. 33, 34, 35, 36.

"The relationship discovered between two of the most typical cases and a probable infection of the schools, where the prevalence of the disease is a feature ordinarily met with in all countries where diphtheria exists, led to a comprehensive survey of diphtheria carriers directed to the detection of same among exposed people in private households and principally in the schools and other institutions. A tabulated report of the facts which followed this survey is given as follows :—

Diphtheria survey, October, 1915.

	Number.	Per cent.
Carriers found in schools	475	13·82
Carriers found in private households	145	9·92
Total	620	12·29

November, 1915.

	Number.	Per cent.
Carriers found in schools	30	2·18
Carriers found in private households	8	1·97
Total	38	2·13

December, 1915.

	Number.	Per cent.
Carriers found in schools	1	50·00
Carriers found in private households	10	9·00
Total	11	9·82

"From the data tabulated above and after an attentive study of the situation the following facts were disclosed :—

"1. A percentage of 9·64 of diphtheria carriers found among exposed but otherwise healthy people both in schools and private households, can only be regarded as excessive in comparison with an average of 3 per 100 reported in the current incidence of the disease in New York and other cities of the United States.

"2. The special significance of this excessive number of carriers as regards :—

"(*a*) The perpetuation of a certain strain of diphtheria bacilli in Manila by means of uncontrolled carriers:

"(*b*) The special importance of this number of carriers as an eloquent indication of an actual or closely threatening epidemic.

"3. The high proportion of virulent cultures taken from carriers, amounting, according to a report rendered by the Bureau of Science, to 35·71 per 100. The test of virulence was performed on, and caused the death of, guinea-pigs in three days.

"4. The fact as shown by a report of the medical officer in charge of San Lazaro Hospital, that out of 602 carriers hospitalized not less than 22 (3·65 per 100) developed symptoms of diphtheria of varying severity. This observation tends to indicate the possibility that actually harmless diphtheria bacilli in healthy carriers may assume a higher degree of virulence, and then cause the development of clinical symptoms.

"5. That this serious condition of affairs made it imperative to employ energetic measures as represented by the extensive taking of swabs from suspicious or exposed people, and strict hospitalization of all cases and carriers; this for the reason that the house isolation of the people as affected would afford very little, if any, safety in such a country as the Philippines, where in the average case neither the construction of the houses nor the close and affectionate intimacy among the members of a family would warrant dependence upon any form of house isolation or quarantine. The total number of people hospitalized (cases and carriers) on account of diphtheria during 1915 was 807."

FOOD.

The Government Chemist (W. RALSTON, B.Sc., Lond., F.I.C.), Nigeria, gives the composition of food stuffs as tabulated* :—

Composition of Food Stuffs; Percentages.

Foodstuffs.	Refuse. and dirt.	Dry Solids.	Water.	Ash.	Fibre.	Proteids.	Carbo-hydrates.	Oil.	Calories per lb.
Rice	·67	84·12	15·88	·45	·10	7·31	75·83	.43	1532
Yam (ordinary)	16·5	33·38	66·62	·64	·41	2·02	30·24	·07	597
Cocoa-Yam	113·0	39·49	60·51	1·05	·57	2·44	35·30	·12	702
Sweet Potatoes	15·4	43·9	56·1	·54	1·0	1·94	39·99	·43	799
Foofoo (wet)..	—	33·12	66·88	·28	1·23	·69	30·80	·12	600
,, (dry)	—	92·93	7·07	·77	3·44	1·93	86·44	·35	1685
Palm Oil	·02	—	·58	—	—	—	—	99·42	4017
Split Peas	—	87·57	12·43	2·35	1·26	24·62	57·47	1·87	1592
Oyo (fresh, green)	88·2	15·88	84·12	1·77	1·18	3·63	8·44	·86	276
,, (dried)	—	93·53	6·47	10·4	6·95	21·38	49·73	5·07	1625
Ockro (dried)	—	75·44	24·56	5·68	7·11	11·41	49·74	1·5	1303
Native Peppers :—									
(*a*) Small pod red and green mixed (fresh)	—	24·57	75·43	1·29	6·88	3·77	9·11	3·52	510
Small pod red and green mixed (dried)	—	93·25	6·75	4·89	26·10	14·32	34·57	13·37	1905
(*b*) Large pod red (dried) ..	—	93·9	6·1	5·75	25·93	17·61	31·06	13·55	1905
(*c*) Large pod green (dried)	—	91·85	8·15	5·35	26·30	20·69	30·41	9·1	1776
Large pod green (fresh)	—	13·48	86·52	·78	3·86	3·04	4·47	1·33	261

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* Nigeria. Annual Medical and Sanitary Reports of the Northern and Southern Provinces for the Year ending 31st December, 1915, pp. 121–122.

"The yams and potatoes were cooked, mashed and dried till the weights before and after cooking were identical, and the percentages therefore may refer both to the raw material as to the cooked foodstuff. The refuse shown represents matter not eaten, while the two columns for 'Dry Solids' and 'Water' represent 100 parts of edible foodstuff, the percentages of the dry constituents being detailed in the other columns. The sum of these constituents in each case equals the total dry solids. The cocoa-yam specimen was much decayed, but normally the refuse will probably be about the same as for other yams and potatoes (15–16 per cent.).

"The 'calories per lb.' column gives a scale for comparing the food-values of the different foodstuffs, carbohydrates (with fibre) and proteids being each equivalent to 1,820 calories per lb., and the oil to 4,040 calories per lb. A former analysis of ordinary potatoes gave these a value of 438 calories per lb., so that with this result and those found for rice and split peas agreeing with published tables, the results shown in the table may be compared directly with those for other well-known foodstuffs. . . .

"Referring to my earlier work on food values as stated above, a comparison between the carbohydrates reveals the fact that yams contain about 1¼ times as much starch as potatoes do. The potato has been a profitable source for alcohol, so it is to be presumed that the yam under similar conditions should be even more profitable."

Scientific Milk Adulteration.

The Sanitary Commissioner for Assam, in his Report for 1915 (p. 21), shows how the indigenous milkman, to the benefit of his purse, makes the cheaper buffaloes' milk approach the appearance and chemical composition of the dearer cow's milk :—

"The best samples were obtained from Dibrugarh, where sophistication seems less common than elsewhere. The degree of adulteration is not generally very serious. Most of the milk sold in the towns of Assam seems to consist of buffalo milk or mixed buffalo milk and cow's milk, with that proportion of water added to it which brings the amount of fat present in the milk to a proportion equal to that present in normal cow's milk, and reduces the figure for the total solids and specific gravity to below the standard of an unadulterated cow's milk in this respect. The milk as it is sold after adulteration thus contains about as much cream as ordinary cow's milk, but less of the other food constituents, but as milk fat is always considered to be the most valuable constituent of milk, the adulteration does not appear to be a very serious one."

Tea Adulteration.

The Annual Report of the Board of Scientific Advice for India states that on examining samples of teas one sample was found to contain "40 p.c. of earth" in addition to the presence of "yellow aniline dye."

WATER.

The Sterilization of Water Supplies.

Under the head of "Dysentery and Diarrhoea" the Sanitary Commissioner with the Government of Bombay (Major F. H. G. HUTCHINSON, I.M.S.) makes the following remarks at page 8 of his Fifty-Second Annual Report for 1915 :—

"The dysentery death-rate in all these towns represents a very serious loss to the community and deserves attention. The disease, though rife during the hot weather in many places, is mainly a monsoon epidemic: that is from 60 to 80 per cent. of the deaths are reported during the last half of the year. The line of action from which benefit is most likely to result is sterilization of the drinking water-supply. This was tried after the beginning of July in the case of Poona City and the death-rate in the year fell from 9·49 to 5·38. The important point is that only 40 per cent. of the deaths were registered in the last half of the year instead of the usual 70 or 80 per cent.: again the reduction in the death-rate between the ages of 1 and 5 was very marked during the same period: this brings forward another fact that the chief causes of death at this age period are diseases of which diarrhoea is a prominent symptom. A study of the dysentery death-rates by age periods for the districts of Poona, Sholápur, Ahmednagar, Sátára and Ratnágari emphasises the two facts that dysentery and diarrhoea are diseases especially fatal to children under the age of 5 during the monsoon months. . . .

"The monsoon epidemic is undoubtedly largely due to the washing of surface impurities into the water supplies, and a great reduction in the sickness and mortality in Poona City was obtained by sterilization of the water with chlorine. In time this benefit can be extended to other towns provided with a general water-supply. Smaller towns especially those to which pilgrims are attracted need not be neglected, for Professor Cree Brown of the Engineering College has invented an apparatus for adding chemicals in correct proportion to small quantities of water: this apparatus can be worked wherever a reliable pump can be installed."

Again, in describing the subject of "Fevers," he traces further beneficial influence of the process:—

"In all the districts with the exception of Kánara and Ratnágiri from 40 to 60 per cent. of the deaths registered from fever between June and October are among children under 5. It is well known that intestinal disorders during early years of life commonly cause fever, and are very fatal. It has been pointed out in the section on cholera that in one village 10 deaths from choleraic diarrhoea were included under the heading fever, and this is no isolated instance. It is also certain that in infective intestinal affections of children death may occur before diarrhoea has had time to set in and when fever is probably the only symptom. The experience of past years has proved that the fever death-rate is exceptionally high in those years in which cholera is epidemic. All these facts point to intestinal disorders causing some portion of the fever mortality. The causes of intestinal disorders in children are the drinking of contaminated water and the eating of impure and unsuitable food, and there can be no reasonable doubt but that measures designed with the object of eliminating impure water and food will result in a lowering of the fever death-rate in addition to improvement in the mortality from cholera and diarrhoeal diseases. Impure water and food are at the bottom of the high mortality in this Presidency, and must receive attention before any material and continued improvement in morbidity and mortality can be expected." [p. 10.]

Step Wells and Guineaworm.

Major HUTCHINSON, I.M.S., in his Report for 1915, as Sanitary Commissioner with the Government of Bombay, makes the following observations as to the necessity for protecting step wells from approach by persons suffering from guinea worm*:—

"As a portion of the money [£46,662] is spent on the repair and construction of wells it may be possible in the future to devote a moiety of similar grants to the eradication of guineaworm by the conversion of step-wells into draw-wells. The distribution of guineaworm has received a great deal of attention during the past 7 or 8 years, and many suggestions for dealing with step-wells have been sent in. A remarkable instance of the benefit given by such a simple measure is furnished by the village of Palus in Sâtâra District, with a population of about 4,000. In the old days a very large percentage suffered from guineaworm, it is said about 50 or 60 per cent. The favourite source of water was a step-well. Through the foresight of a revenue official the step-well was converted into a draw-well about 20 years ago. Guineaworm has almost disappeared; there are now only seven cases against as many hundreds in old days. The seven cases existing now live in two houses (five in one and two in the other), and draw water from a small step-well.

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* Fifty-second Annual Report of the Sanitary Commissioner for the Government of Bombay, 1915. 1916. Bombay: Printed at the Government Central Press, p. 23.

"Palus is situated in an area in which guineaworm is very prevalent, and Dr. da Gama, the Acting Deputy Sanitary Commissioner, has made a close enquiry into the conditions existing in 11 towns and villages. The population of these villages is 42,814—21,900 being males and 20,914 females. At the time of the investigation there were 1,606 persons suffering or nearly 4 per cent. The incidence on males was nearly double that on females, and the largest number of sufferers was found among adults between 15 and 40.

"The conversion of step-wells into draw-wells will not eradicate all ailments due to impure water, but, if properly done, will do away with guineaworm, and show the inhabitants of the affected areas the value of simple sanitary improvements."

Water Supply, British Guiana.

The sinking of deep artesian wells has been completed in fifteen places in British Guiana. Evidently, the necessity for well protecting sources was urgent. Surgeon-General WISE states:—

* "The customary water supply is of the most primitive character, is of bad quality and at times lacking in quantity. Ponds and trenches fed by rain or surface peaty water led through canals for many miles and freely open to surface pollution in most cases serve as the only supply. Not a single village has a supply that would conform to modern requirements. Dr. Gewand in the Skeldon District reports 'the quality of water consumed by the villagers at times is simply atrocious.' Medical Officers universally condemn these inadequate supplies and petitions for the provision of deep artesian wells are frequent. It is little wonder that intestinal diseases have in the past caused numerous deaths, incalculable sickness and irreparable loss."

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* British Guiana. Report of the Surgeon-General for the Nine Months, April to December, 1915. 1916. Georgetown, Demerara: The Argosy Co., Ltd., pp. 12–13.

SANITARY ORGANIZATION.

SANITARY CONTROL OF PUBLIC GATHERINGS.

The Report of the Philippine Public Health Service for 1915 points to the important rôle in disease spread played by large gatherings of human beings for religious or other festivals. He states:—

> "The 'fiesta,' which is a time-honoured institution in the Philippines and the principal event in the yearly history of each town, and which combines religious celebration of the patron saint's day or a pilgrimage to some venerated shrine with many features analogous to those of a country fair, has often been the occasion of an outbreak of dangerous communicable disease. The crowds which gather at these events are likely to contain persons recently exposed to infection or contagion, and some of the large quantity of foodstuffs which are brought in, are sure to have been contaminated. There is a tendency to excess in eating, and an indigestion thus brought on may afford just the opportunity for the development of a case of cholera in a person harbouring the organisms of this disease in a quiescent state. Twice during the past few months, at Jagna, Bohol, and at Carcar, Cebu, cases of cholera have occurred in territory in which there was no previous evidence of infection, immediately following the 'fiestas' and in persons who had attended them, and from Jagna the infection spread to four other towns and cost 31 lives." [pp. 57–58.]

In the Madras Presidency, efforts (more or less complete in accordance with funds at disposal of public bodies and other variable factors) have been systematically made since 1868 to control disease spread from foci created by pilgrim gatherings. Recently, the Government of India directed "that a comprehensive enquiry should be made over the whole of India by the Sanitary Commissioner, assisted by local officers in each Province, into the possibility of improving the Sanitary arrangements at centres where pilgrims concentrate for worship, with the special aim of reducing mortality from disease such as cholera."* A Committee† was accordingly appointed for conducting this enquiry in the Madras Presidency.

The following extracts from this Report furnish a warning of the necessity, common to all sanitary work. that it be thorough. The Committee states:—

> "The second point which the Committee wish to emphasize is that, from what we could gather in the short space of time at our disposal, the smaller festivals in out-of-the-way parts of the Presidency are to be regarded with much more suspicion as foci for the spread of the disease than the large ones. This is after all what one would expect. In many of the large festivals very careful and elaborate arrangements are made, as for instance at the Chitrai festival in Madura, still more on such occasions as the Mahamakham and the Pushkarams of the Godavari and Krishna. Everything that can possibly be done by vigilant and active officials is then done

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* Madras. Report of the Pilgrim Committee, 1915. 1916. Simla: Printed at the Government Monotype Press, p. 1.

† President: Lieut.-Col. W. W. CLEMESHA, I.M.S., Officiating Sanitary Commissioner with the Government of India. Members: Lt.-Col. H. THOMSON, I.M.S., Acting Sanitary Commissioner for Madras; Mr. E. S. LLOYD, I.C.S.; The Hon. Rao Bahadur M. RAMCHANDRA Rao Pantalu Garu, Chairman, Municipality, Ellore; Dr. H. W. McCaully HAYES, M.R.C.P., Chief Medical Officer, South Indian Railway; Dr. A. I. JACKSON, F.R.C.S., District Medical Officer, Madras and Southern Mahratta Railway.

to render the spread of infection impossible, and given average luck in the way of suitable climatic conditions it is unusual for these big festivals to be a serious source of danger. We were struck with the great frequency of the remark that 'it is no use your investigating the conditions here, but you ought to pay more attention to a small dirty place situated a few miles off.' At every large pilgrim centre we have visited, particularly Rameswaram, Srirangam, Kumbakonam, Tirupati, and Conjeevaram, the same statement was made accompanied with the remark that much of the infection of the larger towns is actually derived from those places. The Committee endeavoured, as far as possible, to sift the truth of the statement, and, as far as we can judge, from the very inadequate figures placed at our disposal, we come to the conclusion that there is probably much truth in such remarks.

"It would not be fair to the local authorities to say that these smaller places are altogether neglected, but it is certainly legitimate to state that conditions in them are certainly more favourable for the spread of cholera than in large places where better arrangements and a filtered water-supply exists.

"The Committee therefore consider that the future policy of the Government should be to greatly improve both the local conditions of these smaller places and to exercise greater vigilance over them than it is at present done during festivals.

"Of course all places where the number of pilgrims is large must receive the greatest care and well-thought-out arrangements must be made early, but much of the good that will accrue from the careful supervision of these large festivals will be undone by neglecting a small and insanitary place in the immediate neighbourhood." [p. 13.]

DOES SANITATION PAY ?

In the Philippine Islands, the Bureau of Health is now succeeded by the Philippine Health Service. That under its former name this public service has done excellent sanitary work, is evident from the statistics now issued in the Report for 1915. The record shows that whilst, in 1911, the death-rate in Manila was 35·09 per mille it declined as follows:—

1912	33·32
1913	24·48
1914	22·38
1915	25·54

In remarking upon this manifest saving of life. Dr. J. D. **Long**, Director of Public Health, states *:—

"A brief review of the general conditions of the country with regard to mortality and prevalent epidemics and infections during the year covered by this report shows that every gain made during the previous years, was due not only to the continuance of the work of sanitation, but also to the fact that progress has been made in combating those diseases and reducing their morbidity and mortality to a minimum."

Notwithstanding convincing figures of this nature, municipal bodies exist in the Philippines who have a remarkable family likeness to public bodies generally, oriental and, may it be said, occidental. This is Dr. **Long**'s testimony to the fact:—

"In the remaining provinces there seems to be no possibility of effecting the organization during 1916. A number of them, according to statements of the provincial treasurers, are facing deficits, or have already incurred heavy fixed term obligations or are carrying overdrafts, and in several it would appear that a term of years will be required to arrive at a satisfactory financial basis. There is a disposition on the part of some to let health matters go in ordinary times, and to depend upon this service when the inevitable result appears in the form of an epidemic, and on that of others to treat the health budget with much less liberality than those of other branches of governmental activity, and to scan it first when the need for retrenchment arises. It has frequently been necessary to object to the abolition of a sanitary inspector's position for which the reason of a reduction of expenses was advanced, in municipalities in which no other attempt at economy was evident, and one province which had a good health organization threw it bodily overboard about two years ago in endeavouring to avoid financial shipwreck. The protection of the public health is as essential a part of the functions of government as is the preservation of public order or the prevention and punishment of crime, but this conception has not yet thoroughly permeated the public conscience, of which governmental activities are but the reflection. Meanwhile, the legal obligation of the provincial and municipal governments to make provision for a health fund at the earliest possible moment must be insisted upon. The budgets of those provinces and municipalities which have not done so, should be carefully scrutinized for possibilities of economy, ande no province or municipality should be allowed to undertake any new project which would interfere with its duty in this regard or in any other way to increase its expenses, until it has first fulfilled this obligation, and it is strongly recommended that His Excellency, the Governor-General be urged to issue instructions in this sense." [pp. 46–47.]

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* Report of the Philippine Health Service for the Fiscal Year from January 1st to December 31st, 1915. 1916. Manila: Bureau of Printing, p. 6.

PART-TIME SANITARY OFFICIALS.

The Central Board of Health, Jamaica, opens its Report for the year ending 31st March, 1916, with the following definite opinion as to part-time Sanitary officials:—

*" The Central Board of Health have in the period under review, and as the result of experience of the sanitary work of the Parishes, maintained the position that in parishes, particularly those of large area, it is not in the public interests for the sanitary work to be performed by one Health Officer of Health, who is a part-time officer."

What may be accomplished by a correctly supervised Sanitary staff is thus exemplified, in the same Report, by Dr. Oliver CROSSWELL:—

" In this connection I might remark that I have given, with the able assistance of Mr. E. Glen Campbell, the chief Sanitary Inspector and staff of Sanitary Officers, much attention to food supplies and more sanitary methods of handling food stuffs; and the suppression of flies and their breeding places. A special ' Trades ' Sanitary Inspector, Mr. C. P. Hogarth, has been placed in charge of this special work in the scheme of re-organization now under trial. He is performing excellent work and has already revolutionised the hitherto insanitary habits of the small shopkeeper and vendor of food stuffs in the wanton exposure of their easily infected stock to contamination by dust and flies. In the shops all such food stuffs are now required to be kept under cover. In the barber shops, proper sterilization of equipment is demanded, and it is now possible to obtain a sanitary hair-cut and shave in a majority of the more respectable shops. In the cafés and restaurants, with a few exceptions, doors and other openings are screened with mesh wire against flies.

" The local ice-supply from the Central Factory to the small distributing branch shops has become more sanitary, and each vendor is now compelled to store his supply of ice in a proper sanitary box. . . .

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* Jamaica. Annual Report of the Central Board of Health for the Year ended 31st March, 1916. Jamaica: Government Printing Office, Kingston, p. 1.

"So long as Bakers are allowed to bake their bread in unsewered premises with liquid manure running from their tables into open yard gutters . . . and employees are allowed to deliver unwrapped loave with dirty hands and without due regard to cleanliness of apparel; and in the case of the milk purveyor, so long as milk can be hawked about on the streets without proper restrictions being placed on this kind of itinerant trading, so long will Typhoid Fever and intestinal complaints be rampant in this parish." [pp. 10 and 11.]

PUBLIC HEALTH SERVICE, MADRAS PRESIDENCY PERSONNEL.

The Sanitary Commissioner with the Government of Madras, in his Fifty-second Annual Report for 1915, states that 31 Municipalities have been selected for the appointment of Health Officers, but that difficulty was experienced in filling the whole during the year. He states:—

"The qualification required for appointment as First-class Health Officers is a medical qualification registrable under the British Medical Act and a British Diploma in Public Health.* For a Second-class Health Officer, the minimum qualification required is an L. M. & S. degree and a certificate of having undergone the special practical training prescribed in G.O.1568M., dated 29th September, 1915. . . . During 1915, forty-three men qualified as Assistant Sanitary Inspectors and 26 Assistant Sanitary Inspectors took the higher qualification of Sanitary Inspectors, after undergoing a course of practical and theoretical training in Minor Sanitary Engineering. Thirteen Sanitary Inspectors employed under Local Bodies passed the quinquennial examination prescribed by Government and twenty-one qualified as Vaccinators at the King Institute. One of our Chief Sanitary Inspectors (Cocanada) was selected for sanitary duty under the Civil Surgeon of Basra." [p. 12.]

ACCESSORY AIDS TO THE HEALTH SERVICE.

Major JUSTICE, I.M.S., gives the following note on this aspect of sanitary efforts †:—

"Considerable interest has been aroused in, and an additional impetus given to the question of town-planning by the visit of Professor Geddes. Since his advent, it has formed the subject of reports by Messrs. Lloyd, and Lancashire and lastly by Mr. Lanchester who have overhauled the various schemes which the municipal councils had on hand. The reports of the first named officer have already been considered in consultation with the Sanitary Commissioner, whilst those of Mr. Lancashire and Mr. Lanchester are under consideration. It is hoped that as a result it will be possible to evolve workable schemes, which whilst satisfying artistic and architectural designs will not fail to meet sanitary requirements. . . . An important feature of the year's work was the assembly of the Pilgrim Committee of this Presidency with the Sanitary Commissioner with the Government of India at its head. The Committee made an extended tour to the more important pilgrim centres and the result of its labours has been embodied in an interesting report which will doubtless receive the careful consideration of Government. The Pilgrim Committee closed its sittings at Madras on the 18th September. A photographer was attached to the Sanitary Commissioner on his tours with the Committee and several interesting photographs illustrative of sanitary defects for making lantern slides for the health lectures were taken.

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* B.S. Sc., of the Madras University, has since been declared to be equivalent to D.P.H. of the United Kingdom.

† Madras. Fifty-Second Annual Report of the Sanitary Commissioner, 1915. 1916. Madras: Supt. Govt. Press, pp. 13 and 17.

"The Health Exhibition held during the close of the year and the lectures delivered in connection therewith were another interesting feature. The Exhibition which was organised and carried out with considerable thought and skill was a great success and doubtless afforded a useful object lesson and a stimulus to interest in matters sanitary. Such exhibitions coupled with the health lectures illustrated by lantern slides, for the delivery of which arrangements are approaching completion, should be helpful in maintaining the interest already aroused and in gradually educating the masses on the benefits of sanitation."

THE VALUE OF LABORATORIES IN DISEASE PREVENTION.

DR. J. LONG, Director of Public Health in the Philippines, thus asserts the value of laboratories in aiding sanitary efforts in preventing and controlling disease spread* :—

"The health officer who has no laboratory facilities at his disposal is most seriously handicapped in his efforts to prevent the spread of these diseases, as the effectiveness of the appropriate special preventive measures depends to so large a degree upon the promptness with which they are applied, and this in turn upon an early diagnosis which frequently cannot be had without laboratory methods. Indeed the most effective measures which can be taken against some of the most dangerous of the dangerous communicable diseases, are the detection and isolation of those apparently healthy persons who nevertheless are carriers of the respective organisms, and here the detection is entirely a laboratory procedure.

"Until this year, there were no laboratories outside of Manila except in connection with various hospitals, and the remainder of the provinces, a large majority, were without these facilities. Their usefulness and the great need existing for them, was brought to the attention of the provincial boards with a request in each case for the appropriation of the comparatively small sum required for their establishment. . . ."

"A comparison of the history of the Cebu outbreak [cholera] with that of those in Bohol and La Union, both promptly reported, and efficiently handled, is a most complete demonstration of the necessity of providing all the provinces with laboratories. The measures taken in the latter districts, consisting of house quarantine of cases and contacts, disinfection, burying of excreta, wholesale hand washing with disinfectant solutions, and protection of water and food, had necessarily to be applied to all who were under suspicion of being dangerous to the health of the public. In Cebu, it was possible to point out through the results of laboratory examinations just those persons who were harbouring in their intestines bacteria dangerous both to themselves and the public, and to limit the measures taken to such persons, so that they were at the same time less onerous, less expensive, and more effective."

PROTECTION OF MILK SUPPLIES.

The Report of the Director-General of Public Health, New South Wales, for 1914, shows that the subject of sanitary care of the people is enforced by several highly practical legislative measures. As far back as 1886, the Dairies Supervision Act was passed. The administration under this Act is not left to casual efforts by various public bodies, but is under the direct care of the Department of the Public Health. Under it serve a Chief Veterinary Inspector, aided by an Assistant Veterinary Surgeon with control over fourteen Inspectors in the Metropolitan District; for rural areas, fourteen Inspectors are solely occupied in travelling throughout dairying districts, making detailed inspections. They have to deal with 19,000 registered dairymen and dairy herds of 500,000. Dr. Robert PATON, the Director-General of Public Health, describes the objects held in view by his Department:—

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* Report of the Philippine Health Service for the Fiscal Year from January 1st to December 31st, 1915. 1916. Manila: Bureau of Printing. pp. 48 and 50–51.

> "The desire of the Department has been always that the work of these inspectors should be educational, and that structural improvements to dairy premises and the maintenance of a high standard of cleanliness should be secured without recourse to harsh measures, except where more conciliatory treatment has failed to obtain the desired object. . . .
>
> "For the purpose of economy and to save duplication of work, the dairy instructors of the Department of Agriculture were authorised as inspectors under the Board of Health, with the object of handing over to them the inspection of butter factories and creameries. This arrangement has now been in operation for a couple of years, and is found to work satisfactorily. . . . It is evident that if this important industry is to be maintained at a high standard, the inspectorial staff must be constantly on the alert to ensure that the standard required by the Board is closely followed. Another feature that commends itself to the Department is that local authorities who are charged with carrying out the provisions have lately been seeking advice from the expert officers of the Department in regard to various matters connected with the dairying industry—such, for instance, as the selection of a suitable site, construction, drainage, and ventilation, etc., of dairy premises. The adoption of the advice given will result in more hygienic and up-to-date methods being adopted." [p. 5.]

MEAT EXPORT SUPERVISION.

New South Wales has not allowed its valuable trade in meat to run the risk of being jeopardized by the possibly avaricious trader. The Cattle Slaughtering Act of 1892 gives full power of supervision of the trade, and this rightly is administered by the Department of Public Health. For this purpose, there exists a separate branch of fifteen inspectors under an experienced Veterinary Surgeon.

The figures appended for 1914 will show the magnitude of the meat export trade of this State. The canning business in particular is rapidly expanding, and the value alone of the canned meats and meat extracts exported during 1914 is roughly estimated at three-quarters of a million sterling.

Meat and meat extracts, etc., exported during 1914:—

Packages of canned meats	437,429
Packages of meat extracts and essences .	7,129
Carcases of mutton and lamb..	1,925,756
Carcases of veal	13,296½
Carcases of pork	402½
Beef quarters	160,385
Packages of meat (other than carcases) ..	54,276

SANITARY RULINGS.

JAMAICA.

The Central Board of Health, Jamaica, among other efforts towards sanitary legislation, places on record the following* :—

"They recommended that Law 35 of 1910 be amended so as to give the Board power to pass Bye-laws with regard to Enteric Carriers, also to institute a procedure by which persons could appeal against questionable nuisance Orders, in view of a somewhat hard case that had been brought to their notice in one of the parishes. They also desired to have brought into force legislation with regard to the registration of and practice of miwifery by midwives in the Island and also for an amendment to the Registration Law enforcing earlier notification of Births in accordance with the most recent British Law with a view to a reduction in the very high infant death-rate." . . .

"Additional Bye-laws *re* bakehouses compelling the wearing of uniforms by persons employed in bakehouses in the towns of St. Ann's Bay and Brown's Town." . . .

'Bye-laws relating to the Medical examination of persons employed in the selling of confectionery, sweetmeats, cakes, etc. " . . .

"It was suggested by the *Hon.* H. A. L. Simpson that the Bakehouses Bye-laws should provide that the certificate of an employee should be suspended if, while in possession of it, he was found to be suffering from disease liable to infect. Bye-laws not containing this provision have before approval been returned to various Parochial Boards concerned with the suggestion that it should be adopted and in all cases the suggestion has been adopted. The suggestion was a very necessary one." . . .

"The undermentioned were recommended by the Central Board of Health to the Government to be added as Nuisances to the Proclamation made by the Governor in Privy Council on 25. 8. 13, but the recommendation was not approved by the Government.

"1. The absence from any premises, on which there is a dwelling or on which labourers are employed or do work, of a sufficient and sanitary (flyproof where required) latrine or privy or of such number and of such description and construction and in such position as may be required by the Medical Officer of Health.

"In the case of Estates on which indentured or second term coolies are employed the absence of such sufficient and sanitary flyproof latrines or privies of such number, description and construction as the M. O. H. or Medical Officer appointed by the Governor to be in medical charge of each estate shall require to be provided.

"Provided always that such latrines or privies are not so called ' surface latrines ' and are properly protected from access of beast or bird; and provided always that it is a proper water closet, bucket latrine or pit, passed as satisfactory by the M. O. H., and that in each case it is protected from wind, weather and seepage.

"2. The omission to keep a latrine or privy in a clean and sanitary condition at all times.

"3. The omission to empty buckets when full or to empty or fill in pits when full up to within two feet of the ground.

"4. The existence of rat holes or rat runs in any house or wharf or yard or other premises."

OVERCROWDING.

The General Board of Health, Trinidad and Tobago, during 1915 issued an order regulating space per head in dwellings. Its provisions are two :—

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* Jamaica. Annual Report of the Central Board of Health for the Year ended 31st March, 1916. Jamaica: Government Printing Office, Kingston, pp. 2, 3, 4.

"1st.—That on the serving on the owner and occupier of certificates by the Sanitary Inspector of unfitness of any room or part of a house for human habitation, the room, etc., shall be vacated within six days.

"2nd.—The minimum space allowable for each person in an inhabited room shall be 300 cubic feet, and the area of the ventilating openings in addition to usual doors and windows shall amount to one-tenth of the floor space.

"The operation of this Order will no doubt result in lasting and perceptible good, more especially in the dwellings of the poorer class. For a number of years under Dr. Dickson's instructions, attempts had been made to advise house-owners to improve the ventilation of the worst types of dwellings. The result had been very disappointing, and only a show of doing something resulted in a few cases, for the reason that there was no power to enforce the structural improvements that were considered necessary."*

STRAITS SETTLEMENTS.

The new Quarantine Ordinance of the Straits Settlements "gives discretionary power to the Port Health Officer to prevent the arrival in the Colony among others of people suffering from syphilis." The following are details given by Dr. G. A. BROOKE, the Chief Health Officer, Singapore, of other rulings secured† :—

"(*a*) An attempt has been made (as far as I know, for the first time in any statute-book) to lay down a standard of epidemicity. Such a standard must of course be an arbitrary one, but is most useful as a routine indication for the imposition of quarantine restrictions. If generally adopted it would much simplify matters for the Commercial world. The standard now chosen was only adopted after weekly returns had been charted, and infected arrivals noted, from all the chief Eastern ports, for a period of over 10 years.

"(*b*) Another new feature is the recognition as 'suspected' of any port at which infectious disease exists in a merely 'sporadic' state.

"(*c*) The vaccination of unprotected immigrants from China and India is now insisted on.

"(*d*) Considerable discretionary powers are given for the detention and treatment of contagious ophthalmia, trachoma, phthisis, syphilis, malaria, etc., occurring amongst immigrants; and for the repatriation of those whose entry would be undesirable owing to chronic diseased conditions.

"(*e*) A new section has been added dealing with nuisances on ships, and giving wide powers for the abatement of them.

"(*f*) A new Bill of Health has been introduced. The stereotyped and more or less universal form which was previously in use, gave a minimum of information and a maximum of verbiage. It is hoped that the form now adopted will be of some real and practical use to the Health Officers in other ports.

"(*g*) The principle is now recognised of not requiring quarantine restrictions at subsequent ports in the Colony in the case of certain ships which have been examined and given pratique at their first port of arrival. Such a permit is not given to immigrant or other classes of suspicious ships; but, generally speaking, mail steamers and cargo-boats will come under the category, and such a privilege will be of great commercial advantage to the shipping firms."

---

* Trinidad and Tobago. Medical Report of the Surgeon-General for the Nine Months ended the 31st December, 1915. Council Paper No. 133 of 1916, pp. 27–28.

† Straits Settlements Medical Report for the Year 1915. p. 69.

RAT-PROOFING BUILDINGS.

At Tacoma, Washington, America, the following concise ruling has been issued*:—

"The foundation walls of all buildings hereafter erected in the city of Tacoma built less than 18 inches above the level of the ground at all points, shall be of concrete or of brick or stone laid in cement or mortar, or of some other equally good rat-proofing material. The walls, if constructed of concrete, shall be not less than six inches thick, and if constructed of brick or stone, not less than eight inches thick. Such walls shall extend around the entire area to be occupied by the building and below the surface of the ground to a depth of at least 18 inches. Any building in which foodstuffs of any kind, whether for man or animals, are to be stored or offered for sale, shall have the full floor area covered by concrete not less than three inches thick, and all floors which are situated below the level of the lowest street on which the building impinges shall be similarly covered by a layer of concrete not less than three inches thick."

* U.S. Public Health Reports. 1916. Dec. 8. Vol. 31. No. 49. p. 3397.

TREATMENT OF WASTE.

NIGHT SOIL DISPOSAL IN NEW SOUTH WALES.

The following is a description of a method of treating night soil as practised by Messrs. STAMP and POWELL, of Canterbury, New South Wales*:—

"The first operation of filling the cylinders with night-soil was performed. . . . It is in these cylinders—which are known as the Stamp-Powell Patent Vacuum Revolving Driers—that the main portion of the process is thus carried out; the dimensions of the cylinders are 12 ft. × 6 ft.

"The necessary heat is applied by means of steam between the inside and outside cylinders and as the cylinder revolves the night-soil contents become thoroughly evaporated, all noxious smells are drawn off by means of the special vacuum plant and pass from the cylinder through a surface condenser, thence to the vacuum pumps, discharging into a dome-topped brick and cement tank, the effluent being used for market gardening, the foul air being led away by means of a pipe to the boiler fires. After eleven hours of drying treatment, the residue left in the cylinders is automatically turned out by simply taking off the man hole in the outside of the cylinder. There is nothing offensive whatever in the residue, which is then further put through a grinder and made up into an excellent fertilizer known as Poudrette."

THE PRIVATE SEPTIC TANK OR "SALGA."

In its Public Health Bulletin, No. 68, of 1915, the United States Service sets forth for general information certain principles as to the disposal of human excreta in unsewered homes. After describing a box arrangement (protected by a fly proof lid) containing a movable receptacle for faeces, they illustrate the method of using septic action in securing liquefaction of faecal matter.

The following illustration (fig. 1) sufficiently explains itself. It is known as the L. R. S. (LUMSDEN, ROBERTS and STYLE) privy:—

Fig. 1.

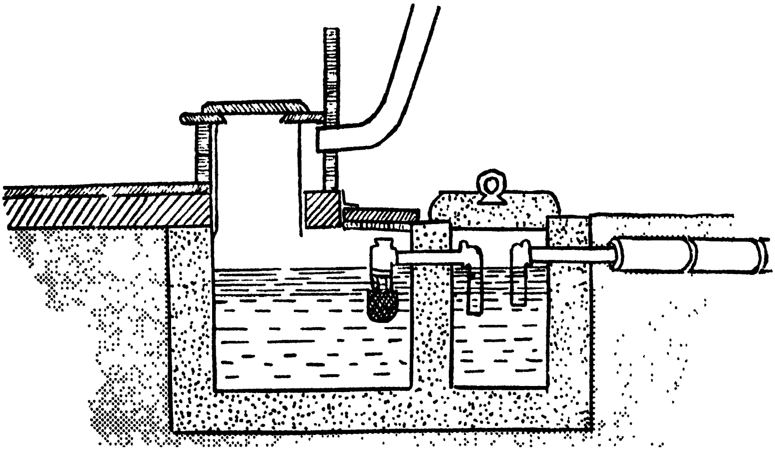


Fig. 1. † An L. R. S. privy with tanks made of concrete and with direct distribution of effluent into top soil.

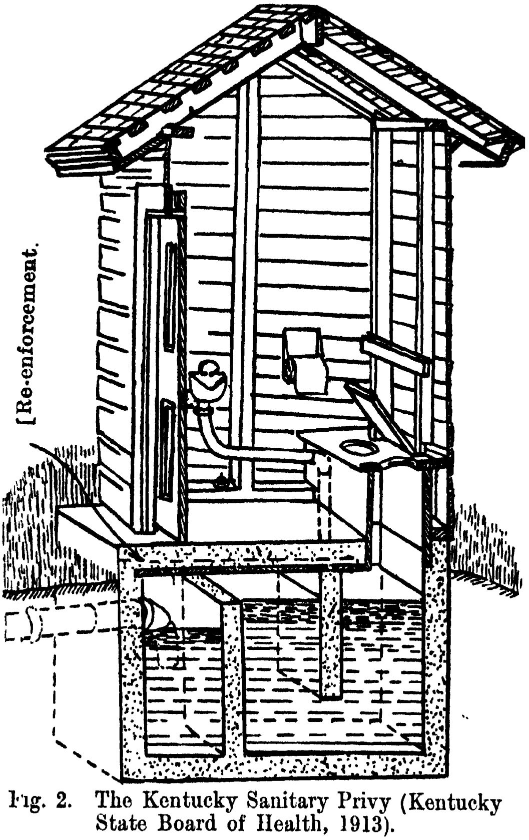
---

* Disposal of Sanitary Matter Revolutionized. S.P.R. Process, 1915. October. B. & R. Fertilizers, Ltd., Canterbury, N.S.W. p. 8.

† Figs 1, 2 and 3 reproduced by permission from the United States Public Health Bulletin.

A more advanced form of the L. R. S. privy is known as the "Kentucky Sanitary Privy" as shown in fig. 2. "In the privy there are three tanks, and the effluent from the final tank is discharged into a system of drain tiles arranged to distribute the effluent under the surface of the soil. In the construction of this privy, it would be well to make provision for cleansing the tanks."

Fig. 2.



NOTE.—Although the outlet pipe is shown on this end of tank, it may be placed at either side.

Fig. 2. The Kentucky Sanitary Privy (Kentucky State Board of Health, 1913).

A roseate view of the result of using the L. R. S. (septic tank) effluent is thus illustrated.

Fig. 3.

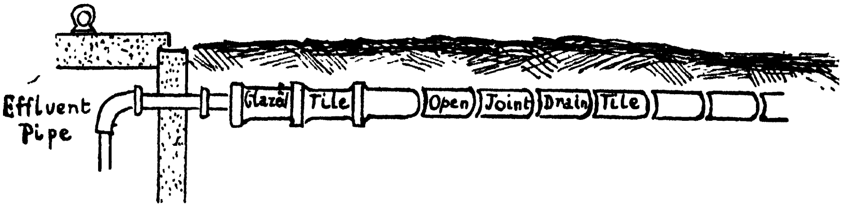


Fig. 3. Distribution of effluent from an L. R. S. privy into top soil. The effluent pipe is cemented into a glazed (water-tight) terra-cotta pipe which extends to the disposal ground. The effluent is distributed into the soil by means of open-joint drain tile.

[NOTE. —The original drawing shows rose bushes growing above the drain.]

SANITARY WORKS.

ANTI-MALARIA WORKS.

"*Anti-malaria Drainage.*—A scheme for anti-malaria drainage work in the Purasawakkam area Madras has also been designed. The general principle is to drain the tanks to the lowest level possible by gravitation. The drains are designed to discharge into the Otteri Nullah at various points. As an experiment, a small portion of the scheme has already been carried out, and the results are sufficiently favourable to indicate that the execution of the whole of the proposed scheme is most desirable in order to drain the Purasawakkam tanks and swamps which form such extensive breeding grounds for malaria-carrying mosquitoes. . . . In the year under review the total mortality was 36·0 per mille as against 46·6 per mille in 1914 and the causes conducive to such happier times have been indicated in the report of the Health Officer. Amongst these causes decreased malaria has contributed to rendering the city healthier and to keeping down the total mortality rate. . . . Anti-malarial measures in the Mylapore Division of the city are conducted with much less opposition and greater co-operation and necessarily better woik of a permanent nature was done during the year under review. This has resulted in a perceptible improvement from the point of view of malaria. The total mortality was 35·8 per mille as against 48·8 per mille in 1914 and the mortality from fever 2·4 as against 5·3 or 6·75 per cent. of the total mortality as against 10·90 per cent. in 1914. That is, while the fall in total mortality for 1915 was only 26·65 per cent. that from fevers was 54·70 per cent. Nor is the infantile mortality behind. It was 253·8 against 295·0 in 1914."*

COST OF DESIGN AND EXECUTION OF WORKS.

The Administration Report of the Madras Corporation 1915–16 gives the following useful figures on the above subjects [p. 123]:—Waterworks, value of work designed R.68,09,500; percentage of designing establishment on value of work designed, 2·86; value of work executed, R.42,76,955; percentage of supervision on value of work executed, 3·51.

SILTING.

The prevention of soil erosion is of importance in connection with anti-malaria work and agriculture. The process, as conducted at Java, is thus described by *Indian Engineering* (Calcutta), of October 14th, 1916, pp. 245–6.

"When the land slopes steeply it is terraced and provided with contour drains edged with hedges of leguminous plants; where the slope is moderate there is a system of catch-water trenches in contour alignment. In terracing it is obvious that some of the plants will lie on subsoil unless it is arranged to use the contour drain soil to cover the subsoil, and this may constitute one objection to terracing; but it is not a serious one. In lieu of terracing it is sometimes the practice to pile weeds between the rows of tea planted in contour lines and thus gradually to build up a system of small terraces, after the tea has been planted out, which prove quite effective. In Java they always protect the edge and face of a terrace with some description of tenacious plant, and when the terrace is fairly broad they dig short trenches at intervals along its inner edge to catch any soil that comes down from above, and when these trenches are cleared periodically the soil collected is always flung up on to the upper terrace.

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* Administration Report of the Corporation of Madras for 1915–1916. 1916. Madras: Thompson & Co. p. 29.

Where the slope is moderate and the land not terraced, the usual practice is to have a contour trench. Then one or two rows of tea plants, then a contour line of green crops, then again one or two rows of tea plants, then another contour trench, and so down the slope. The positions of the catch trenches, which are usually about 12 feet long by 1 foot broad by 1½ feet deep, alternate with 12 feet intervals along the contours, and are arranged in echelon with those next above, so that if any soil is carried past one line of trenches and past the intermediate tea bushes and green crop hedge, it will be eventually caught in the next trench below. Here, too, when the trenches are cleared the soil is invariably flung up the slope. It must be remembered that the basis of any system is perfect drainage, be the ground steeply sloping or otherwise; main drains leading down the slope catch all the water collected by the contour drains and subsidiary ones discharging into them, the important thing being to carry away rapidly all excess water which cannot sink into the ground sufficiently rapidly in case of heavy showers. The main drains leading down are usually natural ravines which require but little adjustment; when they are wholly artificial, naturally the sites selected are between concave folds of the ground along which the drain is cut, the sides are grassed and the rush of water in them is interrupted by a series of low barriers of stones, bamboos, etc."

DIFFICULTIES IN SEWERAGE WORKS.

The Administration Report of the Madras Corporation for 1915–1916 gives the following account of the difficulties in laying sewers in a treacherous subsoil saturated with water:—

"The principal works in course of execution are the Gravitation Mains for the Napier Park and Purasawakkam areas. In constructing these mains, great difficulties have been encountered due to water and bad ground. This has been more particularly the case with the Purasawakkam Main, where it was found necessary to use interlocking steel piles for excavation, and to substitute cast-iron pipes for the brick sewer originally intended. The ground in which the pipes were laid proved so treacherous that very special methods had to be adopted. For a considerable length the ground consisted of semi-liquid black mud, necessitating the driving of long timber bearer piles with cross pieces, to which the pipes were strapped to prevent their sinking into the mud when they were full, or being forced upwards by the mud when empty. These difficulties coupled with the rise in prices have caused the cost to exceed that provided in the original estimates of 1913." [p. 29.]

SURFACE AND SUBSOIL DRAINAGE.

According to the Annual Medical and Sanitary Report for Nigeria, 1915:—

"Lagos is the only place where a system of subsoil drainage has been laid, and here it has proved very effectual, preventing, in the area affected, the periodical floods which used formerly to occur during the rains.

"Permanent surface drainage has not been extended to any great extent, but the amount which has been completed has proved useful. At Forcados and Burutu especially, but also at other stations, considerable work has been accomplished in extending the existing systems of earth drains and in clearing and keeping clear those previously cut. At places such as those named, tidal drains are the only means of removing a large quantity of the water which occasionally accumulates, and their maintenance in good condition—which is essential—involves a considerable amount of labour." [p. 53.]

FILLING BY DREDGERS.

The dredger, according to the Annual Medical and Sanitary Report for Nigeria, 1915, is fulfilling good work in that Colony.

" Reclamation has been carried out at Apapa and Forcados by means of sand deposited by the pump dredger. At the former place 44,000 cubic yards have been deposited, and at the latter considerable improvement has been effected.

" At Lagos, Bonny, Burutu and Port Harcourt similar work has been done by hand labour, although at the last mentioned place, where an extensive area of swamp has been converted into useful ground, the use of mechanical transport has afforded considerable assistance." [p. 53.]

VITAL STATISTICS.

NIGERIA.

The Senior Sanitary Officer writes[†] that the general health of the European official population has been good and compares favourably with the previous year., There were four deaths as against five in 1914, and twenty-five cases of invaliding as against forty-one in 1914.

Table showing the Sick, Invaliding, and Death Rates of European Officials.

	1914.	1915.
Total number of European officials resident ..	1,740	[*]
Average number resident	822·33	[*]
Average daily number on the sick list	12·3	11·4
Total number invalided	41	25
Percentage of invalidings to average number resident	4·98	[*]
Total number of deaths	5	4
Percentage of deaths to average number resident	·62	[*]

" It has been customary in the past to regard as invalids only those cases which became unfit to remain in the country prior to the expiration of a tour of twelve months' residential service, and this system has been adhered to in this report. During the year 1914, owing to the exigencies of the war, Medical Boards were held on many officers who had completed a year's service. These cases have not been included in the above tables, nor have cases of invaliding and death which occurred among officers on active service with the Cameroons Expeditionary Force."

Non-Official Native Population.

Vital Statistics.

" Registration being compulsory in Lagos and Ebute Metta only, statistics are available from these places only, and are as follows :—

Estimated population	77,982
Total births	2,704
Total deaths	1,960
Total deaths of infants under 1 year ..	706
Infant mortality	261·09 per 1,000 births.
Still births	140

" The total estimated population of the colony and southern provinces, based on the census of 1911 is :—

Europeans	1,650
Africans	7,856,000
East Indians	99
Mixed and Coloured	487
Total	7,858,236

[†] Nigeria. Annual Medical and Sanitary Reports of the Northern and Southern Provinces for the Year ending 31st December, 1915, pp. 40, 41, 42.

[*] Figures for 1915 are not available.

VITAL STATISTICS, NIGERIA, 1916.

LAGOS.

Year.	Total births.	Birth-rate per 1,000.	Total deaths.	Death-rate per 1,000.	Deaths.						Total deaths under 5 years.	Rate per 1,000.	Total still-births not included in return.	Estimated population.
					Under 1 year.	Rate per 1,000.	Between 1 and 2 years.	Between 2 and 3 years.	Between 3 and 4 years.	Between 4 and 5 years.				
1909	2,312	43·3	1,975	37·0	729	13·6	135	90	52	49	1,055	19·4	155	53,299
1910	2,389	44·2	1,937	35·8	774	14·3	78	61	54	44	1,011	18·7	123	53,986
1911	2,430	39·8	1,873	30·7	692	11·3	74	54	38	31	889	14·5	132	61,000
1912	2,391	39·1	1,829	29·9	670	10·9	108	50	29	35	892	11·3	118	61,000
1913	2,437	38·02	1,867	29·1	643	10·03	103	85	53	33	917	14·3	129	64,096
1914	2,261	35·2	1,735	27·06	610	9·5	88	58	35	37	828	12·9	111	64,096

EBUTE-METTA.

Year.	Total births.	Birth-rate per 1,100.	Total deaths.	Death-rate per 1,000.	Deaths.						Total deaths under 5 years.	Rate per 1,000.	Total still-births not included in return.	Estimated population.
					Under 1 year.	Rate per 1,000.	Between 1 and 2 years.	Between 2 and 3 years.	Between 3 and 4 years.	Between 4 and 5 years.				
1909	264	35·2	284	38·2	83	11·1	12	11	1	2	109	14·6	21	7,417
1910	262	32·3	325	40·1	83	10·2	20	4	7	2	116	14·3	17	8,104
1911	288	24·0	317	26·4	91	7·5	12	4	2	7	116	9·6	22	12,000
1912	315	26·2	346	28·8	71	6·9	21	10	6	11	119	9·9	28	12,000
1913	327	25·9	311	21·6	83	6·5	19	5	3	9	119	9·4	25	12,609
1914	337	26·7	308	24·[illegible]	96	7·6	14	9	7	3	129	10·2	17	12,609

The interest taken by the late Sir William MacGregor in improving the sanitary condition of Lagos is well known, and it must be gratifying to those who knew his enthusiasm to find the saving of life which has resulted.

The following statistics exhibit a steady decrease of total mortality both at Lagos and Ebute-Metta. Exception might be taken to the decreased birth-rate in both instances, but the infantile mortality (per 1,000 births) for the three years ending 1914, although still heavy, exhibits decided decrease when compared with the three preceding years:—

Vital Statistics.[*]

Lagos, 1914.

Number of deaths of children under five years of age	828
Percentage of deaths of children under five years to total number of deaths	47.7
Death-rate of children under one year per 1,000 births	269.7

Ebute-Metta, 1914.

Number of deaths of children under five years of age	129
Percentage of deaths of children under five years to total number of deaths	41·8
Death-rate of children under one year per 1,000 births	284·8

The grade of infantile mortality is at all times a test of sanitary conditions of a locality and, in this case, the improvement may well have been aided by the "Lagos Ladies League," founded by Sir William MacGregor in 1901 "for the purpose of providing medical attendance, distributing quinine, providing nursing and food and the general care of the sick poor in Lagos, particularly infant, and for the instruction and dissemination of a knowledge of the rudiments of hygiene and simple methods of treatment of disease."[†]

STAFF.

In dealing with a population where medical aid does not always mean the employment of men taught European methods, it must result that the statements of cause of death are not such as readily to lend themselves to compilation of trustworthy vital statistics. Therefore, to place in the position of Registrar of Births and Deaths medical men capable of making personal enquiries as to death causation, is an aid to a desirable end. Major Justice, I.M.S., the Sanitary Commissioner with the Government of Madras, makes the following observation in his Annual Report for 1915:—

---

[*] *loc. cit.*, 1914. p. 61.

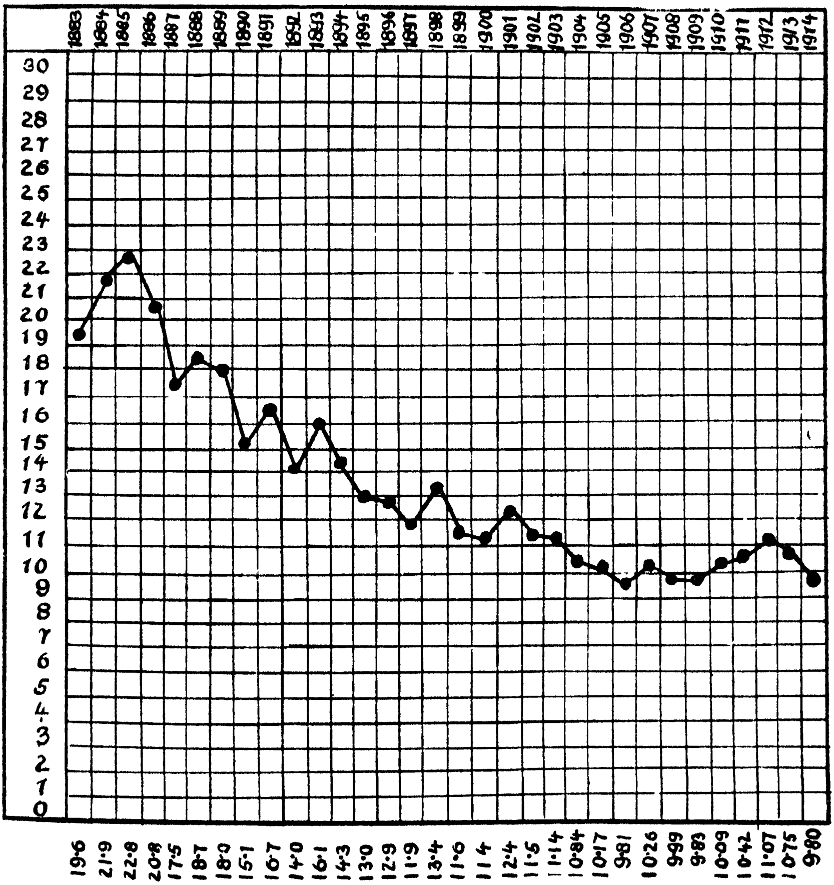
[†] *loc. cit.* p. 60.

" The staff employed for the registration of vital statistics both in urban and rural areas, and the methods adopted for the collection and tabulation of the results secured underwent no great change during the year under report. A scheme was recently approved by Government for the employment of better paid Registrars of Birth and Deaths in Municipalities†; it is also proposed to entrust the work of registration of vital statistics in big towns to Medical Registrars. The latter proposal has much to commend it, and its introduction will give better results." [p. 2.]

DOES SANITATION PAY ?

The annexed diagrams, extracted from the Report of the Director-General of Public Health, New South Wales for 1914, show that even if the indirect effect upon labour and commerce be excluded from consideration, the saving of life is clearly demonstrable as a result of continuous sanitary effort.

Diagram showing Annual General Death-Rate from all causes per 1,000 living in the Metropolis for the Years 1883–1914, inclusive.



NOTE.—Since 1898 the necessary correction has been made for the deaths of non-residents occurring in Metropolitan Hospitals.

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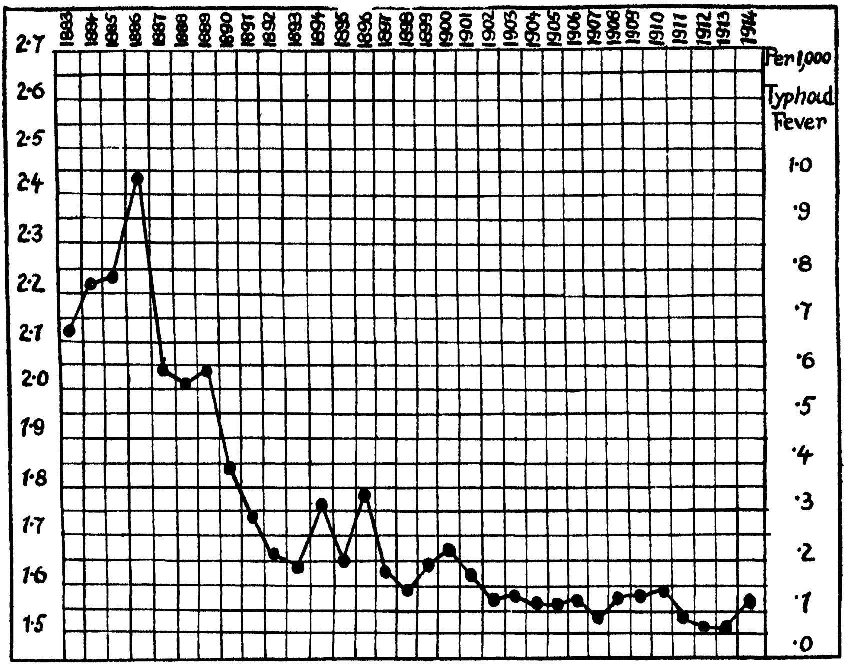
† G.O. 1592 M, dated 22nd August, 1914.

Diagram showing Annual Death-Rates in the Metropolis per 1,000 living from Typhoid Fever.



Note.—Since 1898 the necessary correction has been made for the deaths of non-residents occurring in Metropolitan Hospitals.

Labour Supply in the Tropics.

According to the Sanitary Commissioner with the Government of Madras, the South of India makes a considerable contribution to the labour market of the colonies* :—

> " Emigrants to Fiji, British Guiana, the Straits Settlements, Burma and Ceylon numbered 380,339, against 273,785 in the previous year. Immigrants (excluding the indentured emigrants) totalled 277,363 against 333,166 in 1914. Emigrants during the year exceeded the immigrants by 102,976 ; so it appears that there is yet great scope for labour outside the Presidency."

Suicides and Sex.

According to the Sanitary Commissioner for Madras, in his Report for 1915 [p. 10], " as usual, suicides among females were more frequent than among males, the proportion being 117·6 female to every 100 male suicides."

---

* Fifty-second Annual Report of the Sanitary Commissioner, Madras, 9 15. p. 2.

Reprints and Pamphlets received:—

CUSHNY (A. R.) & YAGI (S.). On the Action of Cobra Venom. Parts 1 & 2.—*Philosoph. Trans. Roy. Soc., Lond.*, 1916.

Note.—On direct application (not through agents or booksellers) any of the foregoing reprints or pamphlets will be sent on loan to any part of the world, the Bureau paying outward postage.

Books received.

BAYLISS (William Maddock) [M.A., D.Sc., F.R.S.] Principles of General Physiology.—xx+850 pp. Roy. 8vo. With 259 Illustrations. 1915. London: Longmans, Green & Co. [Price 21*s*. net.]

HURST (Arthur F.) [M.A., M.D. (Oxon.), F.R.C.P.] Medical Diseases of the War.—151 pp. Demy 8vo. With 9 Charts. 1917. London: Edward Arnold. [Price 6*s*. net.]

PROCEEDINGS OF THE UNITED STATES NATIONAL MUSEUM. Vol. 50. xiv+663 pp. With 36 plates and 290 text-figs. 1916. Washington Govt. Printing Office.

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Works in the Bureau Library may be consulted between 10 and 5.

The Director can be seen between 10 and 1; for a later hour an appointment should be made.

The Director will be glad to receive early copies of Authors' papers on Tropical Diseases for notice in the *Bulletin* and for the Library. To be addressed — TROPICAL DISEASES BUREAU, IMPERIAL INSTITUTE, LONDON, S.W. Inclusion in the "Reprints and Pamphlets Received" should be taken as acknowledgment of their receipt.

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The INDEX and TITLE PAGE to Vol. 8. will be issued as early as possible. The Index will be sent to all subscribers; those who receive the *Bulletin* gratis should, if they wish to have the Index, make special, and prompt, application to the Bureau.

pp. 153-214.] [February 28, 1917.

TROPICAL DISEASES BULLETIN

Vol. 9. 1917. No. 4.

ISSUED UNDER
THE DIRECTION OF THE
HONORARY MANAGING COMMITTEE
OF THE
TROPICAL DISEASES
BUREAU.

General Editor:
THE DIRECTOR OF THE BUREAU.

London:
TROPICAL DISEASES BUREAU,
Imperial Institute, S.W.

Sold by BAILLIÈRE, TINDALL & COX,
8, Henrietta Street, Covent Garden, W.C.

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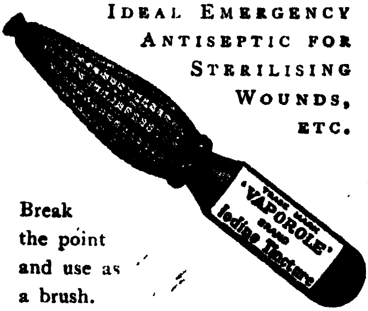

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TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 9.] 1917. [No. 4.

TUBERCULOSIS IN NATIVE RACES.

UNION OF SOUTH AFRICA. **Report of the Tuberculosis Commission presented to both Houses of Parliament by Command of His Excellency The Governor General.** 1914.—iv + 352 + xvi pp. 1914. Cape Town: Cape Town Times, Ltd., Government Printers. [Price 5*s.* 6*d.*]

This Commission was appointed in 1912 to consider the question of the prevalence and spread of tuberculosis, in its various forms, amongst Europeans, Coloured persons, Natives and Asiatics, in the different areas of the Union. Only a very brief account can here be given of the contents of this interesting and valuable blue-book.

The Commission begin by saying that comparatively little assistance can be got from statistical material as regards the main subject of their report. The Census returns for South Africa, previously to 1904, are not absolutely trustworthy as to population, for various reasons, and the registration of deaths has been and still is, to a certain extent, defective, as regards the numbers of the native population, who form the majority of the inhabitants of South Africa. The registration of the deaths of negroes, when in their native kraals, depends upon the headmen, who formerly were paid a fee of two and sixpence per head for each death registered, but of late, for reasons of economy, this payment has been discontinued, perhaps unfortunately. Certification of the causes of death, in the case of natives, is of course only practicable when the patient has been attended by a European practitioner. In the absence of such statistical assistance, the Commission has had to rely principally on the evidence of witnesses.

It seems agreed that, in his native surroundings, the African negro suffers very little, or not at all, from tuberculosis and, as seen at the present day, it is principally the adult male who is affected. As regards whites, there is no doubt that tuberculosis in the South African colonies was principally imported by young Europeans suffering from phthisis, who, attracted by reports of the climate, came out to South Africa in the hopes of finding the whole country a perfect sanatorium. Another special source of infection has been the immigration of natives of India into Natal. The question of these natives is dealt with under a separate heading in the report; they are at present well under control, both as regards inspection and repatriation, when affected with tuberculosis.

Passing on to the negro portion of the South African population, it is shown, from a table on page 96 of the report, that this population numbers at the present time about 4,000,000, of whom 1,500,000 are found in the Cape Colony, 950,000 in Natal, 1,200,000 in the Transvaal, and 320,000 in the Orange Free State, while the white population of the four provinces amounts to 1,276,000, and the mixed and other coloured races to 678,000 (Table on page 86), so that the question of tuberculosis, as it affects the coloured men, is by far the most important part of the problem. Tuberculosis, as it affects the negro, is considered in the report under the three main headings of the negro in his kraal, the negro as an employee of the white man above ground, and the negro as a miner in the gold, diamond and coal mines. This branch of the question is handled in the report with great completeness and scientific adequacy, and makes very interesting reading. The negro in his kraal leads a fairly healthy life, does not overwork himself, lives out of doors all day, makes his skin proof against the rain by covering it with grease and ochre, and takes off his blanket and folds it up so as to keep it dry when it is raining, so that he does not suffer from chill. His diet is generally adequate, and almost entirely farinaceous, and he aids his digestion, quite physiologically, by the use of a mild beer, made from maize, containing only from 2 to 4 per cent. of alcohol, of which the Commission speak quite approvingly, and with a noteworthy absence of prejudice. It is only when the native returns to his kraal after contact with the white man, and is infected with tubercle, that trouble begins. His hut is then the place in which he lies ill until he dies, and he spits all over it, as a matter of course. Most unfortunately for the negro, as the report points out, the coloured man has very little natural resistance to tubercular infection. The cases of phthisis are almost all florid in type and rapidly fatal, and it is rare to find in the body of the negro traces of cured consumption, such as are so frequently to be found in the bodies of white men. The Commission attribute this to the absence of immunization, when young, from closed forms of tuberculosis, of the kind that are so common in the European child. Fatal abdominal tuberculosis is also a very common form in the negro adult.

When the negro enters into the service of the white man in towns, he is generally compelled to inhabit a native location, or quarter. The report has some strong things to say about the conditions prevailing in these locations (pages 124–149) and on the tendencies of municipalities to make a profit out of the rents charged to the natives, without doing for them all that might be done from the health point of view. Water-supply and sanitary matters are generally, in these locations, in a very defective condition.

So much has already appeared in print on the effect of mine labour on the constitution and health of the negro, that it seems unnecessary to recapitulate here what the report has to say on that subject. The generally lucrative character of gold and diamond mining permits the companies concerned to do almost all that is necessary for the comfort and welfare of the native labourer, so far as the arduous nature of a miner's employment permits. The Commission do not apparently find very much to criticize in this respect. The native is paid the whole of his wages in cash, and he buys his own food. Unfortunately, some of the native races are stingy in the matter of their diet, and economize unwisely in it, with the result of falling ill, while others, like the Zulus, feed themselves well. The native is also allowed to choose his own job, according to his liking, without regard to his physical powers, and in this way many a weak man will be found employed at work for which he is not fit. A number of recommendations in this connexion are formulated on pages 208–217 of the report.

Bovine tuberculosis is considered on pages 217–236. It is not a large question in South Africa, except in relation to milking-cows, and pigs kept in connexion with dairies. The negro drinks but little milk. The report terminates with a number of recommendations specially suited to the local conditions of South Africa, but having a general resemblance to those which are found in enquiries of the same kind.

J. B. Nias.

HONEIJ (James A.). **Tuberculosis and Public Health in South Africa.** —*Boston Med. & Surg. Jl.* 1913. Feb. 6. Vol. 168. No. 6. pp. 195–198.

This paper is the outcome of an investigation made during a trip in South Africa. The following distinctive features are noted as characteristic of the disease amongst natives in that country :—

(1) The difficulty of diagnosis in early stages owing to the frequency of other chest diseases such as pneumoconiosis, pneumonia, temporary congestion of the lungs, etc., so prevalent in the mines.

(2) The rapid course of the disease.

(3) The common absence of cough and expectoration in all stages. In a series of post-mortem examinations in a Native Compound Hospital, a large number had the primary centre of infection in the abdomen, the mesenteric glands being the starting point and the spleen the organ most often grossly infected. The terribly high incidence of tuberculosis amongst miners of European origin and the frequency of secondary tubercular infections in cases of " Miner's Phthisis " (30 per cent.) are mentioned and yet the incidence of tuberculosis amongst natives working in the mines is put at 20 per cent. higher. [Contrast the figures obtained by WATKINS-PITCHFORD and others, below.] The author considers that " it is not unlikely that a large proportion of the so-called rapid acute pulmonary cases of tuberculosis are largely secondary to intestinal infection, due to the bovine tubercle bacillus." [That these cases are originally abdominal and only secondarily in the lungs may well be the case, but the comparative rarity of tuberculosis amongst cattle in South Africa makes the theory of bovine infection less probable.] The greater incidence of tuberculosis amongst natives than amongst Europeans in South Africa may be gathered from the following figures, quoted from the Public Health Department's Report for 1908, dealing with the mortality per mille—Whites, 1·29. Coloured, 6·59.

Turning to bovine tuberculosis, Dr. Honeij states that the veterinary Department records only 328 cases of tuberculosis in 1,980,393 animals passing through the Johannesburg market in two years, no less than 252 of these 328 cases being in pigs. From this it would seem that the disease is very rare in cattle, but further on, he puts it at about 7 per cent. of all milch cows in the Union. [Nathan RAW puts the tubercular infection in English dairy cows at 25 per cent., but still 7 per cent. is a very high figure for cattle kept under the conditions obtaining in

South Africa. An indication of how this figure is arrived at and how it is to be reconciled with the Veterinary Report above quoted is desirable.]

Dr. Honeij makes a series of recommendations as to how the disease might be combated in South Africa, the more general of which are as follows:—

"(1) Keep politics out of all health matters.

"(2) Undertake the proper modern sanitation of its towns and districts.

"(3) Totally prohibit all Asiatics, etc., from a health point of view and handle the native question firmly.

"(4) Secure earnest and good workers, scientifically trained for their campaign against tuberculosis."

S. L. Cummins.

Brock (B. G.). **Cows' Milk as an Agent in the Spread of Tuberculosis; especially as it affects South Africa.**—*S. African Med. Rec.* 1916. Apr. 30. Vol. 14. No. 8. pp. 115–124.

The greater part of this article is devoted to the description of a recent paper by Professor Delepine on "The Milk Supply as a Causal Factor in Relation to Tuberculosis," which appeared in the *Journal of State Medicine* for November and December 1914; but at the end the author supplies a few figures of his own. Out of 72,122 cattle slaughtered at the Johannesburg abattoir in 1912–1913, 94 only were found to be tuberculous, a rate equal to 0·13 per cent., while out of 31,313 pigs 313, or 1 per cent., were infected. Figures are also given for various tuberculin-testings of herds of cattle, obtained from the Principal Veterinary Surgeon of the Union, but it does not appear that any of these were composed exclusively of milch-cows. The author goes on to remark that abdominal tuberculosis is extremely common, in his experience, amongst natives, even though they do not drink milk, provided that they mix with infected human beings.

J. B. N.

Watkins-Pitchford (W.), Orenstein (A. J.) & Steuart (W.). **A Preliminary Enquiry into the Prevalence of Pulmonary Tuberculosis amongt Mine Natives.**—*Med. Jl. of S. Africa.* 1916. Feb. Vol. 11. No. 7. pp. 122–124.

In the words of the authors, "This enquiry was undertaken at the instance of the Rand Mines, Ltd., to ascertain the approximate prevalence of pulmonary tuberculosis amongst their native employees. The report is dated September 1915." It being obviously impossible to examine the whole number of natives employed with any degree of completeness, the investigation was limited to two mines only, the "Crown" and the "Robinson." Out of the 13,000 natives employed at the "Crown" mine, 300 were selected by the overseers for examination on a numerical principle, at the rate of one out of every 20, while from the 2,500 employed at the "Robinson," 100 were similarly taken. The men were first of all carefully examined radiographically at the hospital, and all those who showed normal chests by this method were sent back to work. The remainder were retained for further examination, clinically and bacteriologically. The general result showed that out of the 400 men examined radiographically, only 11 exhibited, positive X-ray evidence of tuberculosis. Out of the 11, 8 presented equivocal auscultatory signs, and the remaining 3 none. Only one man had tubercle bacilli in his sputum, and he also was the only one who had fever and a respiratory rate above the normal. Three men out of the 11 reacted definitely to tuberculin tests, four equivocally, and four negatively.

The authors consider that these results go far to show that the danger of tuberculosis amongst mine employees is not nearly so great as is often supposed; at the same time they frame a schedule of recommendations for the detection and isolation of cases of tuberculosis.

J. B. N.

PEIPER (O.). **Ueber die Verbreitung der Tuberkulose in Deutsch-Ost-Afrika.** [The Spread of Tuberculosis in German East Africa.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1914. Vol. 18. No. 14. pp. 479–490. With 2 text figs.

The author, who was for several months in 1912 Director of a native hospital at Dar-es-Salaam, comments on the increase of tuberculosis among the negro and East-Indian population of the place. He attributes this spread of the disease to the Indian immigrant, whose domestic habits are far more filthy and insanitary than those of the negro. The negro washes himself, whenever he can find water, wears clean clothes, does not chew betel and expectorate in proportion, builds his huts separately both in town and country, and is generally of good physical stock. The Indian, on the other hand, is, as a rule, physically poorly made, and therefore follows sedentary occupations. He often brings pulmonary consumption with him from his home, generally Bombay, and builds dark and airless houses, which he keeps filthy and overcrowded. As he generally leaves his women-folk behind him in India, he forms connections with negro women, which are mostly of a temporary character, and in this way he disseminates tuberculosis among the negro population. The author has frequently noticed pulmonary tuberculosis among young negro convicts, and draws attention to the fact that, at Dar-es-Salaam, no proper provision has hitherto been made for the isolation of tubercular prisoners. He insists very forcibly on the necessity for isolating the Indian population altogether in the towns, and for promulgating a special code of building regulations for them. In the year 1903–4 there died in German East Africa of tuberculosis, according to the official returns, only three Europeans and 18 coloured people, but in 1911–12 this number had risen to 17 Europeans. and 90 coloured persons.

In 1913 it was estimated that there were in German East Africa nearly 15,000 coloured persons of non-indigenous origin, of whom the East Indians formed from 5,000–7,000.

J. B. N.

MANTEUFEL (P.). **Vorarbeiten für eine Bekämpfung der Tuberkulose im Schutzgebiet Deutsch-Ostafrika.** [Preliminaries for a Campaign against Tuberculosis in German East Africa.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1914. Nov. Vol. 18. No. 21. pp. 711–730.

According to the author, the number of cases of tuberculosis medically recognised amongst natives in German East Africa has risen from 18 in the year 1903–1904 to 140 in 1912–1913, while the corresponding number in Europeans has risen from 2 to 20. There is thus evidence of a rapidly increasing prevalence of the disease in the Protectorate, both amongst natives and Europeans, which calls for active measures. By far the most prevalent form of the disease is pulmonary phthisis. The author has doubts as to the trustworthiness of von Pirquet's reaction as a test for tuberculosis in negroes, in spite of what PEIPER has said in its favour. He has found a higher percentage of positive reactions in children (25 per cent.) than in adults (22 per cent.), which seems anomalous. Similarly with Indians, the figure for children was 30 per cent., as against only 22 per cent. for adults. In 30 per cent. of phthisical patients in whom the diagnosis had been clearly established bacteriologically, the reaction proved negative. Therefore, data as to the prevalence of phthisis amongst negroes based upon cuti-reactions alone, are not absolutely trustworthy in any sense.

The author has a strong opinion as to the necessity for isolating all cases of demonstrated tuberculosis efficiently, not only for prophylaxis, but also as an indispensable preliminary to the effective use of tuberculin therapeutically in the case of natives.

J. B. N.

WUENN. **Bericht über die Tuberkulose am Kilimandjaro.** [Report on Tuberculosis at Kilimanjaro.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1914. Oct. Vol. 18. No. 21. pp. 731–732.

The author reports an increase in the amount of tuberculosis seen among natives in his district as follows:—

	Pulmonary Tuberculosis.	Joints.
1910–11	2	0
1911–12	5	1
1912–13	8	1
1913–14 (6 months)	11	4

The diagnosis was made certain in all the pulmonary cases by examination of the sputum. The author recommends the immediate establishment of a special hospital, built substantially on the European plan, for the compulsory isolation of all such cases. He remarks that if this is done at once, while the number of cases is still small, there is a good chance of the disease being stamped out. Later on, the cost will be prohibitive. [The population of the district is not given.]

J. B. N.

MUELLER. **Ist die kutane Tuberkulinprobe (Pirquetsche Reaction) als ein brauchbares Hilfsmittel zur Erkennung der Tuberkulose erwachsener Eingeborener anzusehen?** [Is von Pirquet's Reaction a Trustworthy Means of Diagnosing Tuberculosis in Adult Natives?].—*Arch. f. Schiffs- u. Trop.-Hyg.* 1914. Oct. Vol. 18. No. 20. pp. 690–691.

The writer ventures to doubt if von Pirquet's reaction is trustworthy as a means of diagnosis in adult African natives. Recently PEIPER has asserted that among negroes a positive reaction is an indication of active tuberculosis. To test this assertion, the author used the test upon 700 unselected patients in the native hospital at Tanga during the year 1912-13. A positive reaction was obtained in 33 per cent., but in spite of a careful examination of the positively reacting cases, both physically and by means of a microscopic examination of the sputum, signs of active tuberculosis could only be demonstrated in an insignificantly small number. Of 5,612 patients seen by the author between September 1st, 1912 and August 31st, 1913, only 24, that is 0·42 per cent., were found to be tubercular [presumably by other methods]; but out of the same number, 600 submitted to von Pirquet's test gave 200 positive results. To sum up, the author thinks that the reaction is quite unreliable as a test for tuberculosis amongst the natives of East Africa.

J. B. N.

Sergent (Edm.) & Foley (H.). **Exploration scientifique du Sahara Constantinois Oued Rir'.—Oued Souf (avril 1912).**—*Bull. Soc. Path. Exot.* 1914. May. Vol. 7. No. 5. pp. 416–429. With 2 text figs & 2 plates.

In the Sahara, where Europeans have not penetrated to any great extent, tuberculosis is relatively rare amongst the natives. In Figuig, cases of the disease are seldom met with and the proportion of positive cutaneous tuberculin reactions is low. In 500 persons tested, there were but 11 per cent. of positives for children between 0 and 15 years of age and 35 per cent. in older persons. But localities appear to differ. The case of the El Oued district is especially interesting as there exist medical records on the diseases of the locality at different periods in past years. Escard makes no mention of tuberculosis amongst the diseases observed by him in 1886. Legrain, in 1893, saw only four cases of surgical tuberculosis in natives during a year's work in the district, and explained its rarity by assuming a "quasi-immunity of the inhabitants of desert regions." In 1911 Cellerier brought to light the high incidence of tuberculosis observed during two years' service in the district. This diversity of opinion led Sergent and Foley to apply tuberculin tests to the native population, and publish their findings on a total of 265 subjects at El Oued in the appended table:—

Tuberculin Reactions in the Population of El-Oued (Oued-Souf).

	Details.	Total from 0 to 5 years.	Total from 6 to 15 years.	Children from 0 to 15 years.	Adults over 15 years.
From 0 to 1 year ..	0 in 3 cases	1 in 10		76 in 151 =50·3%	
From 2 years ..	0 „ 4 „				
From 3 to 5 years..	1 „ 3 „				
From 6 to 10 years	68 „ 122 „		75 in 141 =53·1%		
From 11 to 15 years	7 „ 19 „				
From 16 to 30 years	45 „ 56 „				93 in 114 =81·5%
From 31 to 45 years	22 „ 27 „				
From 46 to 60 years	20 „ 23 „	..			
Above 60	6 „ 8 „				

Total of 169 positive reactions in 265 cases=63·7 per cent.

It will be seen that, in this district, the tuberculin tests are positive in a degree comparable to Europe; a fact which the authors attribute to the migratory habits of the people of El Oued (the Souofa), who go in large numbers each year to Algerian and Tunisian towns on commercial and other business. [Sergent and Foley appear to assume that the want of conformity in the various medical reports quoted depends on a failure to recognise the frequency of the disease by the earlier observers. It is much more probable that the disease has progressively increased there since the advent of Europeans, and that the earlier workers saw few cases because only a few cases then existed. Parallel instances could be cited amongst the natives of India and various parts of Africa. A note as to the clinical type of the disease, whether mild or acute, and as to the case mortality in El Oued would be of interest in this connection.]

S. L. C.

SERGENT (Edmond) & POUJOL (Jean). **L'infection tuberculeuse chez les indigènes de la région d'Ain-Bessem (Tell Algérois).**—*Bull. Soc. Path. Exot.* 1915. May. Vol. 8. No. 5. pp. 250–251.

The Pasteur Institute of Algeria is pursuing an enquiry as to the prevalence of tuberculosis among the natives of Algeria, by means of the cuti-reaction test. The present paper gives the results for the region of Ain-Bessem, a district of mountains and valleys in the south-west of Kabylia. The children under 16 years of age reacted positively in the proportion of 50 per cent., and the adults over that age in the proportion of 69·4 per cent. The female sex showed a higher proportion of infected cases, namely 70 per cent., as against 66 per cent. for males. The individuals tested, however, were all patients of the local native hospital, who had been taken in for various ailments, and were not selected from the population at large. The total number tested amounted to 273.

J. B. N.

PARROT (L.). **L'infection tuberculeuse dans la région de Gambetta (Hauts-Plateaux Constantinois).**—*Bull. Soc. Path. Exot.* 1915. July. Vol. 8. No. 7. pp. 425–429. With 1 diagram.

An examination of natives in the commune of Souk-Akras (District of Gambetta, Department of Constantine, Algeria), by means of the cuti-reaction tubercular test. The population is agricultural. The percentage of positive reactions among 532 persons tested, of all ages, was 31·1 per cent., the distribution among children being as follows:—

0 to 1 year of age	0 per cent.
1 „ 2 years „	10 „
3 „ 5 „ „	25 „
6 „ 10 „ „	46·6 „
11 „ 15 „ „	55 „

The Berbers are slightly less infected than the Arabs in the proportion of 27·7 per cent. as against 35·1.

J. B. N.

Béguet (M.). Cutiréactions à la tuberculine faites à Alger du 26 avril 1911 au 1er juin 1916. *Bull. Soc. Path. Exot.* 1916. July. Vol. 9. No. 7. pp. 425–429.

During the period April 26th, 1911 to June 1st, 1916, 1,601 cutaneous tuberculin tests were carried out at the Pasteur Institute at Algiers. The tuberculin used was that of the Institute (*tuberculine brute*) diluted with glycerine to one-quarter strength, and the inoculations were all made by scarification of the skin of the right deltoid region. The results were noted between the third and sixth days.

Of the 1,601 persons tested, 1,446 were Europeans, 122 Mussulman natives, and 33 native Jews.

1. *Europeans.* 455 positive results were observed in 1,446 tests. In children there were 390 positive results out of 1,354 tests, or 28 per cent., and in adults 65 out of 92, or 70·6 per cent.

2. *Native Mussulmans.* 115 children gave 44 positive results, or 38·2 per cent., while 7 adults gave 5 positive results.

3. *Native Jews.* The number tested was so small as to give percentage results of very slight value. One positive result out of 12 was obtained in children up to 1 year of age, 5 out of 14 between 1 to 5 years, and 9 out of 18 from 5 to 15 years. The single adult tested gave a positive result.

J. B. N.

Brewer (Isaac W.). Tuberculosis in Tropical Countries and the Necessity for Greater Effort to Prevent it.—*Amer. Jl. Trop. Dis. & Prevent. Med.* 1914. Oct. Vol. 2. No. 4. pp. 270–273.

During a residence of six years in Manila, the author noted the excessive death-rate from tuberculosis and published a paper thereon. In the city of Manila there were 8,244 deaths from tuberculosis in the six years ending June 30th, 1913, of which 1,412 occurred during the last year of the period. Tuberculosis amongst animals in the tropics on the other hand, seems to be very rare. According to Gerhert (*Manila Med. Bull.*, Vol. 1, p. 6) out of 60,000 hogs and 30,000 cattle killed in Manila during 1909, none were tubercular. The same was the case with 94,000 hogs slaughtered in Perak, Selangor and Penang during 1908 and 1909. The author remarks :—

> "The situation in the Tropics, then, appears to be that tuberculosis causes a great mortality amongst human beings, but very few animals suffer from it. The cause must be that the human beings are housed during the night in buildings in which there is no ventilation and the animals live in the open air all the year round. My observations in the Tropics cause me to believe that the predisposing causes of tuberculosis there are the same as in temperate regions, but that certain of them are of greater importance. Industrial causes are negligible, but I believe that the mosquito is the greatest predisposing cause. Not that mosquitoes can transmit the disease. The native dreads malaria, and has learned that by keeping his house closed up tightly after dark his family will suffer less from fever. We therefore find that very little fresh air is admitted to the sleeping apartments during the night. I once counted the number of houses with windows open during the night in the city of Manila, and found about 25 per cent. had windows open. This was during the dry season, and without doubt during the rains the number would be much less. To appreciate the foul condition of the air in a native house one has but to make a visit after the family has retired. . . . Just so long as a tropical city is infested with mosquitoes, just so long will the incidence of tuberculosis be high."

J. B. N.

MATHIS (L.). **Contribution à l'étude du béribéri. Considérations sur la tuberculose parmi la population indigène du Tonkin.**—*Ann. d'Hyg. et Méd. Colon.* 1914. Apr.-May-June. Vol. 17. No. 2. pp. 483–500. [Tuberculosis. pp. 495-500.]

The author, who is a military surgeon in charge of colonial troops in Caobang [Tonkin], comments on the excessive rarity of infantile tuberculosis, among the indigenous population, as showing that the disease is not deeply rooted amongst the people. Meningitis, spinal caries, lupus, and cutaneous tuberculosis the author has never seen. The disease is chiefly to be met with among natives who have associated with Europeans, such as upper-class boys sent to Europe for their education, soldiers, teachers, servants and female concubines. Natives who have resided in Europe for some time generally bring the germs of phthisis back with them. Pulmonary phthisis is by far the most common form of tuberculosis seen and is often very rapid, especially among the native soldiers; disease of the glands comes next and then that of the joints, especially the ankle-joint.

[For a summary of the beriberi portion see this *Bulletin*, Vol. 5, p.110.]

J. B. N.

DOLD (Hermann). **Die Tuberkulose unter der chinesischen und nichtchinesischen Bevölkerung Schanghais.** [Tuberculosis among the Chinese and non-Chinese Population of Shanghai.]—*Deut. Med. Woch.* 1915. Aug. 26. Vol. 41. No. 35. pp. 1038–1040.

Statistics of the prevalence of tuberculosis in Shanghai, taken from the reports of the Shanghai Health Office (Director, Dr. STANLEY). The mean mortality per annum from all causes, from 1900 to 1914, was 17·4 per 1,000 for non-Chinese and 18·2 for Chinese. Of this mortality tuberculosis formed 12·53 per cent. for non-Chinese and 16·72 for Chinese, i.e., 0·22 per 1,000 per annum, and 0·27 per 1,000 per annum respectively. These figures are supported by tables.

J. B. N.

OYAMA (I.). **Average Mortality of Tuberculosis taken from Several Insurance Companies in Japan and the Importance of Inspection for Early Diagnosis.**—*Sei-i-Kwai Med. Jl.* 1915. June 10. Vol. 34. No. 6. pp. 34–35.

A collection of the mortality lists of 32 Japanese insurance companies showed an annual mortality, from all causes, of 10·82 per 1,000 in males, and 12·26 in females. The mortality from tuberculosis alone was 22·43 per cent. of the whole (22·83 in males, and 21·36 in females). This high percentage indicates insufficient medical examination. Ten diagnostic points are enumerated to which special attention should be paid by the examiner.

J. B. N.

SITSEN (A. E.). **Aantekeningen over tuberculose in Indië.** [Observations on Tuberculosis in the East Indies.].—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1914. Vol. 54. pp. 346–350.

A short reply to some remarks by HEINEMANN in a paper contained in the same volume, in which reference is made to a previous paper by SITSEN. [For a summary of these see this *Bulletin*, Vol. 4, pp. 118-9.] Sitsen points out that the spread of tuberculosis in the East is very largely due to the mixture of races. A half-caste population springs up, which is infected on the European side with such things as tuberculosis. A certain proportion of these half-castes go back to work on the land, and thus infection extends to the native villages.

J. B. N.

HEBBERT (R. F.). **Tuberculosis in the Indian Army in France.**—*Indian Med. Gaz.* 1916. Mar. Vol. 51. No. 3. pp. 85–87.

A hastily written paper of small scientific value. Its purport is to draw attention to the fact that a good many men, in the Indian contingents despatched to France, suffered from more or less latent tuberculosis, and developed overt clinical signs on service. The author commences by saying "I am afraid that this article deals with an investigation of a very incomplete character. I myself have been unable to pursue the matter further and collect enough cases, thoroughly investigated and recorded, in order to produce reliable statistics, owing to the sudden withdrawal of my unit from France."

J. B. N.

SALECKER. **Die Verbreitung der Tuberkulose auf den Marianen.** [The Distribution of Tuberculosis in the Marianne Archipelago.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1915. July. Vol. 19. No. 14. pp. 369–376.

The author gives statistics as to the prevalence of tuberculosis amongst natives of the Marianne, or Ladrones, Archipelago, as determined by von Pirquet's test.

The principal inhabitants of these islands are the Chamorros, who at the present time, from intercourse with Spaniards, are nearly all half-breeds. Their standard of living is, proportionately, fairly advanced. Nearly 100 per cent. of the people suffer from ankylostomiasis. Out of 200 Chamorros, of various ages, tested with von Pirquet's test 100 were positive, 88 negative and 2 doubtful. The Chamorros therefore are about as highly infected with tubercle as Europeans.

Statistics are also given for other groups of islanders, as follows:—

1. Out of a number of Caroline Islanders, settled for years in Saipan, the principal island of the Archipelago, 80 were selected of various ages for test, and gave 24 positive, 55 negative, and 1 doubtful result.

2. Out of a number of West Caroline Islanders, recently arrived, on account of the devastation of their native islands by a typhoon in 1907, 97 tested gave 70 positive, 26 negative, and 1 doubtful result.

3. People more recently arrived (in 1911) from the islands of Pisserat and Olol, for the same reason. Of 48 tested, 0 were positive, 47 negative, and 1 doubtful. This was a rather remarkable result, and in contrast with the previous ones. The people themselves were dirty and lazy and mostly occupied in fishing. They suffer largely from ankylostomiasis, and the women are apt to be anaemic in consequence. Many of the women live in the houses of Chamorros, while

the men go to the Chamorros as day-labourers, but without contracting tubercle, so that they seem evidently to possess a relative immunity from tuberculosis.

4. Out of 67 persons belonging to the families of 10 exiled Samoan chiefs, 30, of various ages, were tested; 16 gave positive, 12 negative, and 2 doubtful results.

The general conclusion is that here, as elsewhere, infection with tuberculosis is in proportion to the contact with Europeans.

J. B. N.

KERSTEN (H. E.). **Die Tuberkulose in Kaiser-Wilhelms-Land (Deutsch-Neuguinea).** [Tuberculosis in Kaiser Wilhelm's Land (German New Guinea).].—*Arch. f. Schiffs- u. Trop.-Hyg.* 1915. Feb. Vol. 19. No. 4. pp. 101–108.

The author supplies figures as to the prevalence of tuberculosis among the natives of Kaiser Wilhelm's Land, as determined by PEIPER's modification of von Pirquet's reaction. The data show very clearly the general immunity of the natives from tuberculosis, unless they have come into contact with whites. Of 44 men from the interior, who had only come into contact with white men on bird-hunting and gold-prospecting expeditions, every one was negative. On the other hand, in villages from which men are impressed for plantation work, the men show a considerable percentage of positive reactions, while the women and children are negative. For example, on the Waria river, 22 children and 39 women were all negative, while of 74 men 17, or 23 per cent. were positive. On the Morobi river, again, 42 children and 17 women were negative, while out of 56 men 15, or 26·8 per cent. gave a positive result. In a village on the coast, only four hours by boat from Frederic William's Harbour, 36 children under 6 years of age all proved negative, but out of 50 children between 6 and 14 years 4, or 8 per cent. were positive. Of 76 adult women in this village 15, or 19·7 per cent. were positive, and 23 out of 85 men = 27 per cent.

The author thinks that these figures show very strikingly the dependence of tuberculosis among natives upon contact with Europeans.

J. B. N.

CLARK (H. C.). **Tuberculosis of the Negro Race as Seen in the Panama Canal Zone.**—*Amer. Jl. Trop. Dis. & Prevent. Med.* 1915. Dec. Vol. 3. No. 6. pp. 331-353.

And with discussion. *Proc. Med. Soc. Isthmian Canal Zone.* 1915. Apr.-Dec. Vol. 8. Pts. 1 & 2. pp. 19–43.

During the period extending from December 11th, 1909 to May 6th, 1915, the author was able to collect notes of 703 cases of tubercular disease from autopsies performed, and surgical material sent for diagnosis at the laboratories of the Ancon Board of Health. He remarks that this number does not include all the cases of tuberculosis that died at the Ancon Hospital during that time, because permission for making an autopsy was sometimes refused, and the bodies of white people are often embalmed for shipment. The greater portion of the data were obtained from the bodies of negroes. "The natives of the region," it is said, "as a rule seek admission to their own hospital and, therefore, they are not represented by any considerable number in the series." The majority of the white people also who develop tuberculosis within the Canal zone, are repatriated as soon as the disease is detected, but this does not occur to the same extent with negroes, owing to concealment of the disease until its most extreme stages are reached.

The cases are grouped by the author into three categories as follows: (1) fatal tuberculosis, (2) coincident, that is, present in cases where death was due to something else, (3) surgical material.

As regards origin the number of cases were as follows :—

	Fatal.	Coincident.	Surgical.
West Indian negroes ..	393	135	54
African ,, ..	1	1	0
Mestizoes ..	47	23	7
White Europeans ..	8	0	11
N. American whites ..	1	3	15
Indian ,, ..	1	1	0
Chinese ..	1	0	1
Total	452	163	88

The vast majority of the negroes employed on the Canal zone come from Barbadoes and Jamaica.

As regards ages the distribution was as follows :—

	Fatal.	Coincident.	Surgical.
Under 10 years	16	4	3
10 to 80 years	430	152	76
Over 80	2	0	0
Unknown	4	7	9

and as regards sex :—

Males	399	135	72
Females	53	28	16

As regards the nature of the lesion in fatal cases the numbers were as follows :—

Disseminated tuberculosis	221
Pulmonary ,, ...	153
Acute miliary ,, ...	41
Abdominal ,, ...	14
Meningeal ,, ...	11
Other organs	6
Genito-urinary system	3
Bones and joints..	2
Lymphatic glands	1
	452

It is remarked :—

"The commonest visceral lesion found in the fatal cases was, of course, the pulmonary one. The usual ulceration and cavity-formation was observed but there was little evidence in any of the cases of extensive fibrosis, such as is frequently seen in the white race, except the obliterative process in the pleural sacs. Large or small areas of tuberculous pneumonia were frequently seen. Extensive haemorrhage into the pulmonary cavities was noted at the time of the autopsy in 24 cases, and had been clinically noted in many of the others. Rupture of the lung was found at autopsy in 16 cases. . . . Hydrothorax, pneumothorax and empyema were rather common features. An astonishing number of cases possessed tubercular ulcers in the lower half of the small bowel and in the caecum and ascending portion of the large bowel as well as the appendix."

In the discussion which followed, Dr. P. M. ASHBURN gave the following figures as to the death-rates from tuberculosis from the Sanitary Department of the Isthmian Canal Commission. In 1906, when the total population was 66,000, the deaths from tuberculosis were 4·24 per thousand. The large importation of healthy young labourers began at that time. In 1907, with a population of 102,000 the death-rate from tuberculosis was 2·89 per thousand, and this fall continued as the population increased, until 1911, when the population reached a maximum of 156,000. In this year the tuberculosis death-rate reached its minimum, namely 1·82 per thousand. Now, as the population is decreasing, the death-rate is increasing, reaching 2·58 per thousand in 1914. This is due to the closing up of the Zone towns and to the crowding into cities " where the wage-scale of the labourer is only 25 dollars per month, and his room-rent 5, 6 or 7 dollars per month and market prices are high. It can be readily seen that he cannot feed his family well and surround them with the conditions to enable them to resist either the infection or the spread of tuberculosis." Dr. HERRICK remarked that the figures given for surgical tuberculosis by no means represented the whole extent of its prevalence. Dr. H. P. CARTER said that the 60,000 people in Panama live in 3,000 houses, making 20 persons per house. As many as 11 have been found living in one room. The population have a fear of night air, and all windows and doors are closely shut at night. Promiscuous spitting and general uncleanness co-operate in spreading the disease. The tuberculin test for cows is practically not done at all. Tuberculosis of cattle is, however, practically unknown on the Isthmus. Dr. R. C. CONNOR gave corroborative evidence. Were it not for the deportation of tubercular whites, the mortality would be much higher.

J. B. N.

MICHIE (H. Clay). **A Tuberculous Survey of an Alaska Eskimo Village—Using Children under the Age of 15 Years as an Index.**—*Med. Record.* 1916. Oct. 14. Vol. 90. No. 16. pp. 663–666. With 4 text-figs.

A brief account of the testing of a small number of Eskimo school-children with von Pirquet's tuberculin test. Out of 46 Eskimo children attending a native school, 26 were taken for test, with the result of finding a percentage of 61·53 positive, 23·05 negative and 15·36 suspicious. Eight other Eskimo children attending a better class school for whites, when tested in the same way, gave a percentage of 62·5 positive, 12·5 negative, and 25·0 suspicious. The sputum of 13 out of the 26 children was then examined microscopically for tubercle bacilli and *M. tetragenus*, when three out of 13 showed T. B. and six *tetragenus*.

The conditions of life of the Eskimo in their underground dwellings are shown by the author to be extremely favourable to the propagation of infection.

J. B. N.

STEINER (L.). **Tuberculose et soleil tropical.**—*Rev. Méd. de la Suisse Romande.* 1916. Oct. 20. Vol. 37. No. 10. pp. 653–659.

The author, having practised for 20 years at Sourabaya in Java, has been led to notice the rarity of tubercular affections amongst natives in the tropics, other than pulmonary tuberculosis. He attributes this to the light clothing worn, and to the constant exposure of the body to the sun, especially in the case of children. A hint is thus given for the sun-treatment of tuberculosis, as already practised at Leysin and other stations in Switzerland. It is noted that the Javanese population hardly ever drink cow's milk, and that the dairy industry is hardly known, which may be an additional factor in the rarity of osseous and glandular tuberculosis. The domestic conditions of the Javanese, on the other hand, favour the propagation of pulmonary phthisis, as for example, dirty houses, the habit of expectorating, and personal uncleanliness. Bathing is resorted to for purposes of coolness rather than for washing in the proper sense of the word.

J. B. N.

HEAT STROKE.

PUNTONI (Vittorio). **L'eziologia e la profilassi del colpo di sole.** [Etiology and Prophylaxis of Sunstroke.]—*Ann. d'Igiene Sperimentale.* 1915. Vol. 25. (N. Ser.). No. 1–2. pp. 151–166. With 2 figs.

The author points out that it is necessary to distinguish clearly between sunstroke and heatstroke. Heatstroke is often caused merely by a very hot humid atmosphere aided by unsuitable clothing, but the action of direct rays of the sun is necessary for sunstroke. In heatstroke the etiological factor acts upon the whole, or a great part, of the surface of the skin and nearly always upon the respiratory organs; but in sunstroke it suffices if the sun's rays act upon the uncovered head or spine.

Heatstroke can be roughly explained by an increase of the body temperature, due either to diminution in loss or to great increase in the heat of the skin and respiratory organs. In sunstroke it is a question of the direct action of solar rays upon the meninges or upon the cerebro-spinal nervous tissue; any rise of temperature in this case is secondary to the lesions of the heat regulating centres.

The precise solar rays responsible for sunstroke is a question still debated; a brief summary of the literature bearing on the subject is given.

A series of experiments was undertaken to ascertain to which rays the cranium is diathermal. In the place of the objective in a camera was fixed a disc of cranium taken from the fronto-parietal region of a human corpse in a good state of preservation. The disc was the size of a crown piece and about 10 mm. in thickness, it included all the adjacent tissues from the dura mater to the skin, and contained a certain quantity of venous blood. By means of this simple apparatus the behaviour of the various solar rays in traversing the cranial disc was studied. It was found that the human cranium is diathermal to yellow-red and violet-ultraviolet rays, but absorbs the red and green-blue rays.

A further series of experiments was undertaken to determine which rays produced sunstroke. Albino rats, which are very susceptible to sunstroke, were exposed to the sun, the body being protected, but the head and neck uncovered. Death took place in ten to fifteen minutes and under tropical sun it would have been much quicker. The symptoms were convulsive jerkings which gradually increased to violent convulsions; the respiration and pulse became accelerated. Later the symptoms of excitement subsided, the respiration became faint and irregular and soon the animal succumbed. The neck muscles were rigid and slight meningeal congestion was observed. If an animal were withdrawn from the sun during the period of excitement the convulsive movements continued, it sneezed frequently, the ears were intensely red, the eyes congested and food was refused. These symptoms lasted 24–48 hours and were sometimes followed by death, in which case meningeal hyperaemia was found.

Animals were then exposed to the action of rays of two different kinds—the one rich in violet-ultraviolet rays and the other in red-yellow rays. The former evoked similar symptoms to those observed in rats exposed to the sun, death occurring in 25–30 minutes. Exposure for 1½ hours to rays of the second kind was necessary to cause death and the symptoms did not resemble those of sunstroke.

The author holds that sunstroke is caused by the violet-ultraviolet rays and not by the red-yellow rays. The yellow rays however facilitate matters as they produce heat.

Workers exposed to the action of red-yellow rays (in steel works, etc.), although subject to great heat, exhibit no symptoms of sunstroke, but symptoms similar to those of sunstroke have been observed to follow the action of electric light, rich in violet and ultraviolet rays.

Red-yellow rays are only harmful when accompanied by heat, but sunstroke can be contracted on the ice at low temperatures, by exposure of the head to the sun for only a few seconds and by a filiform ray piercing the badly placed ventilation hole of a tropical helmet. Moreover since manifestations of sunstroke frequently appear many hours after exposure they cannot be due to calorific rays, which produce immediate action.

In discussing the question of prophylaxis the author points out that the first defence against violet and ultra-violet rays is found in the black pigment of the skin, which transforms the various forms of energy of the sun's rays into heat. Prophylactic measures should consist in intercepting firstly the violet-ultraviolet rays which cause sunstroke and secondly the yellow-red rays which facilitate sunstroke. Clothing of a green colour absorbs both the former and the latter; the disadvantage of the absorbent properties of green clothing can be obviated by covering it with white material. The eyes should also be well protected preferably with green glasses.

The conclusions are:—

The tissues which compose the cranium (from the dura mater to the skin) are diathermal both to the yellow-red and to the violet-ultraviolet rays, but they absorb the red and green-blue rays.

Radiations rich in violet-ultraviolet rays (quartz lamp with mercurial vapour) produce in the white rat—a very susceptible animal—all the symptoms of sunstroke.

On the other hand, those abounding in red-yellow rays are ineffective.

It must therefore be remembered that sunstroke is brought about by the action of the violet-ultraviolet rays upon the meninges and the cerebral substance.

At the same time, one must not completely neglect the red-yellow rays, which facilitate the photo-chemical action of the violet-ultraviolet rays by means of the heat which they produce.

With regard to prophylaxis against sunstroke, it is well to protect the susceptible parts (head, neck and spine) with green clothing, which absorbs the violet-ultra violet rays as well as the red-yellow, letting pass the green rays only, which are harmless because they are arrested altogether by the tissues of the cranium.

Since in practice it is necessary to combine the prophylaxis against sunstroke with that against heatstroke, it is advisable to cover the green, heat-absorbing clothing with white material, which is well known to possess the greatest reflecting properties.

The eyes should be protected by means of coloured glasses, and these again, for the above reasons, should be green.

W. Yorke.

BRUNO (G.). **Quattro casi di colpo di calore sulla R. nave "S. Caboto."** [Four Cases of Heatstroke on the S.S. "Caboto."]—*Ann. Med. Nav. e Colon.* 1915. June. Year 21. Vol. 1. No. 6. pp. 654–655.

This paper describes four cases of heatstroke—three on board and one ashore—during the stay the ship made at Hankow in 1914.

The most interesting case was that of the chief quartermaster who had arteriosclerosis as a result of chronic alcoholism and syphilis. After duty on the bridge, he had an attack of fever, headache and vomiting. The conjunctivae were injected but the pupils reacted to light. The temperature was 38° C., the pulse 96 and the respirations 24. There was no loss of consciousness. Application of ice to the head, cold sponging and cardiac stimulants overcame the vomiting but had no effect upon the temperature which rose to 39·5° C. Notwithstanding the rise of temperature the patient appeared better. Three days later the condition was aggravated by a cardiac and respiratory crisis. The face and extremities became cyanotic, there was Cheyne Stokes breathing, the pulse was very frequent and irregular and in spite of treatment the patient died a few minutes later.

Three other cases, which occurred about the same time, presented analogous but less severe symptoms and treatment was followed by a rapid and complete cure.

The author states that the attacks are explained by the external conditions. A high temperature of 41° C. was accompanied by a remarkable degree of atmospheric humidity and almost complete immobility of the air.

The fatal case emphasises the importance of the organic lesions produced by alcoholism and syphilis on the course of heatstroke.

W. Y.

HILL (E. W.). **Report on a Case of Sunstroke.**—*Proc. Med. Assoc. Isthmian Canal Zone.* Oct. 1912 to Mar. 1913 [1914]. Vol. 5. Pt. 2. pp. 47–51.

This is the third authentic case of sunstroke in the Panama Isthmus since the occupation by the Americans. A man was brought into the dispensary in an unconscious condition, the only history obtainable at the time being that he was seen to put his hands to his head, stagger and fall to the ground unconscious; on the way to the dispensary he had several convulsions. Subsequently it was learned that he had been on the Isthmus but ten days and had been perfectly well up to the time of the attack, in fact on the day of the attack he had been credited with ten hours work. On admission the skin was hot and dry; the pulse too rapid to count, thin and compressible; the pupils were contracted and did not react to light; there were convulsive muscular movements; the respirations were 46 and shallow; the face was congested and purple in colour; the axillary temperature was 108·5° and the rectal 110° F. A diagnosis of thermic fever was made. All the clothes were removed, ice was applied to the thorax and abdomen and dry massage was performed to bring the superheated internal blood to the surface. An ice-water spray was thrown on the head. Under this treatment the rectal temperature fell in 14 minutes from

110° to 104° F. During this period a cold water enema at 60–70°F. was given. Occasional convulsions occurred. In 27 minutes the rectal temperature had fallen to 101·5° F.; at this point all measures for the reduction of temperature save an ice cap to the head were suspended, and the patient removed to a dry cot and covered with a sheet. In 33 minutes the rectal temperature was 100° F., the patient became partially conscious and was given small quantities of ice water by the mouth. A perfect recovery was made.

The author points out that four varieties of sunstroke are recognised: (1) Heat exhaustion; (2) Heat prostration; (3) Thermic fever; and (4) Heat cramp. The remedial measures required vary considerably in the different forms. While stimulants and measures to combat shock are indicated in heat exhaustion and prostration nothing, as a rule, seems to be demanded in thermic fever other than the application of cold, venesection and massage. The general indications are four in number: reduction of temperature, measures against cardiac failure, treatment of complications and of sequelae.

The paper closes with a brief discussion of the more recent work on the pathology of heatstroke.

W. Y.

NEILSON (J. L.). **Two Cases of Thermic Fever occurring in the Fireroom of a Battleship.**—*U. S. Naval Med. Bull.* 1913. Oct. Vol. 7. No. 4. pp. 579–583.

This paper records the clinical observations made in two cases of thermic fever which occurred amongst the midshipmen on board the U.S.S. "Illinois." After preliminary instruction midshipmen in the U.S. Navy are required to stand 2-hour watches every second day in the fire and engine room actually performing the duties of machinists, oilers, water tenders, firemen and coal passers under the direction of two commissioned officers and a few experienced members of the crew. The two young men were overcome one afternoon when the outside temperature was 85°F. A detailed account of the symptoms of each case is recorded.

The first had almost completed his watch when he complained that he felt weak and dizzy and could not see well. He was told to leave the engine room at once. When seen by the medical officer a few minutes later he was unconscious, cyanotic and pulseless. The respirations were hardly perceptible and the pupils widely dilated. Whilst the clothes were being removed he had a slight convulsion, and the respirations ceased. A minute or so of artificial respiration started the breathing and the pulse returned; the skin became hot, dry and about the colour of a mild degree of sunburn. Ice was applied to the head and the body sponged with iced water and a quart of ice water given by the rectum. The patient remained unconscious for about 20 minutes; half an hour later his temperature had fallen from 107·5° to 99·8° F. He was then dried and put to bed, and made an uninterrupted recovery.

The second case became ill after he had been on duty in the fireroom for 1¼ hours. Whilst being removed to the sick bay he had a severe convulsion. When seen by the medical officer a few minutes later his skin was hot, dry and pallid except for a slight cyanosis of the face.

The respirations were slow, regular and shallow; the pulse was 160 with marked incompressibility. The pupils were almost pin point in size, and the lids fluttering; the rectal temperature was 107° F. Ice compresses were applied to the head and ice sponges and friction to the body were immediately administered and shortly afterwards a quart of ice water was given rectally. About a pint of salt solution was given by hypodermoclysis. One hour later the rectal temperature was 101° F., the pulse 130 and of very high tension and the respirations shallow and slow. The patient was dried and put to bed, lying naked in the wake of an electric fan. The coma was so deep that there was not the slightest response to supra-orbital pressure, nor even a hastening of respiration upon forcible dilation of the sphincter. An hour later as conditions had not improved about six ounces of blood were withdrawn. Shortly afterwards the pulse became slower and more compressible and the cyanosis disappeared. The first signs of returning consciousness were observed about five hours after the first symptoms appeared but it was not until three hours later that he responded to questions. He also made a good recovery. In both cases the urine collected next day contained a trace of albumin.

W. Y.

LIAN (Camille). **De l'Insolation. Forme méningée, progressive—Forme cardiaque.**—*Presse Méd.* 1915. Sept. 16. Vol. 23. No. 43. pp. 354–356.

After quotation from the " classical study " of VAILLARD, in which it is stated that lumbar puncture has revealed a meningeal reaction in several cases of severe insolation, either simple hypertension of the fluid, or more rarely leucocytosis, the author describes the " progressive meningeal form " which he has studied in three cases.

Two workmen working in distinct localities in the sun in France, in a period of great heat, suffered from headache, prostration, and loss of appetite. Each day the symptoms increased and after a week each was admitted to hospital. There was intense headache, vasor-motor symptoms, slight infrequency of pulse, and rise of temperature to 39°, falling gradually to normal after a week. Lumbar puncture gave exit in jets to a clear fluid, with no increase of cells. In a third case the symptoms were more marked, there being slight Kernig's sign and coma for about 20 hours. In the progressive meningeal form the delay is not only in the onset but in the development of symptoms. They do not disappear for two weeks. Such cases might be taken for acute meningitis.

The cardiac form was seen in a territorial soldier of 42, who was digging a trench on a hot day and had to climb a steep hill to reach his camp. His symptoms, which are detailed, were almost exclusively circulatory. There was acute dilatation of the heart with an extremely marked arrhythmia. He was an agricultural labourer who had never been ill, but there was probably heart weakness for he had suffered before from palpitation. It is remarked that insolation produces a real diminution of the strength of the myocardium. The paper closes with some therapeutic deductions.

A. G. B.

BITTORF (A.). **Ueber Folgezustände des Hitzschlags.** [The After Effects of Heat Stroke.]—*München. Med. Woch.* 1915. June 22. Vol. 62. No. 25. p. 862.

A short account of the subsequent history of cases of heatstroke seen in the garrison at Leipsig in the summer of 1914. Those that ended fatally are not described. The other patients complained at first of headache and great lassitude, and in many instances there was nervous tachycardia with weakness of the voice. Later, in the majority, severe hysterical convulsions came on suddenly. True epilepsy never developed. All slowly improved, and by the end of April 1915 the last was passed for garrison duty. Details of individual symptoms are given; such as dumbness, abasia and astasia, tachypnoea, stammering, disturbances of sensation, attacks of tetany, all of which were regarded as hysterical. In fact every severe case was followed by such symptoms. It is suggested that severe damage to the brain in heatstroke leads to changes of an hysterical character. The prognosis in all cases is relatively unfavourable. No figures are given in this note.

A. G. B.

BRAM (Israel). **The Treatment of Sunstroke and Heat Prostration.**—*New York Med. Jl.* 1914. Sept. 19. Vol. 100. No. 19. Whole No. 1867. pp. 570–572.

The author thinks it dangerous to employ the terms sunstroke and heat prostration interchangeably "as this implies similarity in treatment." He tabulates the differences as follows:—

Sunstroke.	Heat Prostration.
1. History of direct exposure to the sun's rays.	1. History of exposure to excessive heat, usually indoors.
2. Onset sudden, often with convulsions or paralysis.	2. Onset gradual; no convulsions or paralysis, but prodromata (headache, dizziness, nausea, etc.).
3. Usually complete unconsciousness.	3. Rarely, loss of consciousness.
4. Skin hot, dry, and flushed.	4. Skin cool, pale, and clammy.
5. Injected conjunctiva, contracted pupils.	5. Conjunctiva pale, pupils dilated or normal.
6. Temperature very high (105° to 113° F.).	6. Temperature normal, subnormal or slightly elevated (100° to 102° F.).
7. Pulse high and bounding.	7. Pulse weak and thready.
8. Respiration irregular, often Cheyne-Stokes in type.	8. Respiration shallow and sighing.
9. Course brief, with guarded prognosis, terminating in death or recovery in from a few hours to a day or more.	9. Course greater in duration, prognosis favourable, usually terminating in recovery within a few days.
10. Complications and sequelae not uncommon.	10. Recovery usually uninterrupted and complete.

The bulk of the paper is devoted to details of treatment and does not lend itself to condensation. Under the heading prophylactic treatment, "indulgence in alcoholic practices" is condemned and "the same danger exists in persons habituated to the immoderate use of tea, coffee, or tobacco, a fact which seems to have been overlooked by the profession," these substances bringing about a condition of irritability and instability of the functions of the nervous system. The treatment of sunstroke includes ice applications, venesection in certain cases, hypodermic injection of ether or camphor in cardiac weakness, and of atropine sulphate for oedema of the lungs. Digitalis may also be useful. The employment of pilocarpine is condemned. In meningeal irritation quinine and salicylic acid are to be avoided. Antipyretic drugs are contraindicated. In the event of delirium or convulsions sodium bromide, sixty grains per rectum, whiffs of amyl nitrite, or chloroform "to the verge of anaesthesia" should be tried. Heat prostration in children, the author thinks, is often overlooked. He does not say how many cases he has treated by the methods advocated.

A. G. B.

HANSON (George C.). **Chloroform in the Treatment of Insolation.**—*Jl. Amer. Med. Assoc.* 1915. Oct. 9. Vol. 65. No. 15. p. 1277.

In this note the author describes the beneficial action of inhalations of chloroform in three cases suffering from insolation.

In each case the symptoms were well marked, unconsciousness, high temperature (106–107° F.) and frequent pulse. The patients were stripped of their clothes, laid on a bed and chloroform was cautiously given by inhalation. During the first half hour though no other treatment was given definite improvement in condition was noted. Subsequently, ordinary treatment was administered with uneventful recovery.

W. Y.

AMOEBIASIS AND DYSENTERY.

AMOEBIASIS.

JOB (E.) & HIRTZMANN (L.). **Les modes de propagation de la dysenterie amibienne au Maroc.**—*Bull. et Mém. Soc. Méd. des Hôpit. de Paris.* 1916. July 27. Vol. 32. 3rd Ser. No. 26. pp. 1309–1320.

The disease is wide-spread in Morocco, 600 cases occurring in 31 months. There are few deaths, but many invalids result, which is a serious question economically on account of the number of patients who have to be repatriated. Hepatitis also is a frequent complication. These considerations apply especially to East Morocco. The vegetative form of the amoeba is almost innocuous from the point of view of infection as it is a very delicate organism and is easily killed by the gastric juice. It is the cystic form which constitutes the real danger and it is, therefore, not acute cases of amoebic dysentery but convalescents that are a source of danger to others. Of 290 convalescents examined 85 were found to be carriers. Cysts are commonest in patients who have had several attacks. Infected water is a common source of infection. Flies are also undoubtedly important agents in spreading the infection, as they readily pass directly from latrines to food [see this Bulletin, Vol. 9, p. 99]. Another danger in Morocco is the consumption of raw beans. Owing to the unhygienic conditions prevailing the soil must be badly contaminated with infected faeces, and it is only to be expected that this must in turn contaminate vegetables grown upon it. The beans being unsterilised by cooking may form one of the most important methods of spread. In the last year or two better hygienic conditions, such as obtain for instance at Casablanca, have reduced the incidence of the disease to some extent.

E. E. Atkin.

FISCHER (W.). **Ueber die Amöbendysenterie in Shanghai.** [Amoebic Dysentery in Shanghai.]—*Deut. Arch. f. Klin. Med.* 1915. Oct. 29. Vol. 118. No. 2. pp. 129–147. With 2 charts.

The European population of the international settlement in Shanghai numbered about 8,000 in 1913. During the 14-year period 1900–1913 about 271 deaths occurred amongst the European inhabitants of the settlement, from dysentery. This number is arrived at by including cases diagnosed as chronic diarrhoea, and liver abscess. In the same period there were 632 deaths from intestinal diseases, which is estimated to be about a sixth of the deaths from all causes.

The cases collected by Fischer occurred in the practices of the German doctors in Shanghai. Of 262 cases of intestinal infections investigated amoebae were found in 67 (25 per cent.) In addition to this, amoebae or their cysts were found in two out of 25 cases without any suspicion of dysentery. Similar conditions prevailed also in Tsingtau.

In Shanghai most of the cases of dysentery occur from the end of September to December. The very severe cases are most frequent however in July, August and September. The fatality from dysentery and chronic diarrhoea, which is also probably dysentery, is highest in September, as shown in the chart.

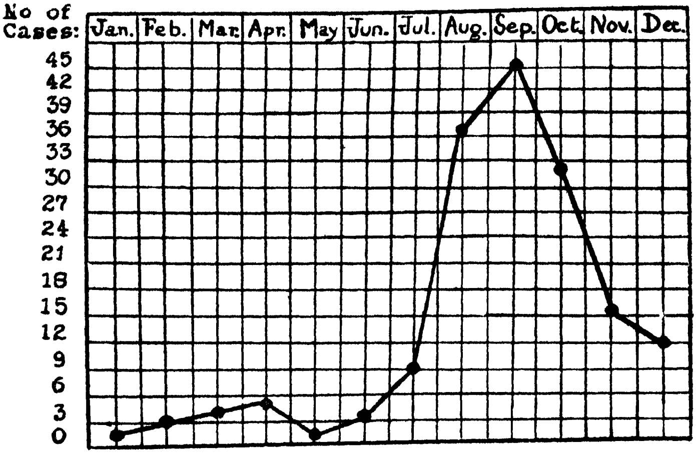

Chart showing deaths from dysentery and chronic diarrhœa per mensem in Shanghai.

The majority of the fatal cases occur during the hottest months of the year, but the greatest incidence of the disease takes place after the hottest period is past and also after the time of maximum relative humidity.

Fulminating cases occur, a fact which is not sufficiently widely recognised. They often pass almost pure blood and a diagnosis of dysentery may not immediately suggest itself. No treatment is of avail and a fatal issue is almost invariable. They occur only in the hottest months, in people who have never before had an attack of dysentery.

Bacillary dysentery being uncommon in Shanghai, the association of *E. histolytica* with Shiga's bacillus is not often seen.

E. E. A.

JOB (E.) & HIRTZMANN (L.). **Pathogénie et histo-pathologie de l'ulcération dans la dysenterie amibienne.**—*Bull. et Mém. Soc. Méd. des Hôpit. de Paris.* 1916. July 27. Vol. 32. 3rd Ser. No. 25-26. pp. 1250–1257. With 5 text-figs.

The ulcerative process is always too advanced in man at death for a study of its complete evolution. This paper is based on observations on young cats infected with *E. histolytica* artificially.

Some of the sections showed traces of the entrance of the amoeba into the cells of the mucosa. It appears to lie in a small cavity, and it is easily seen as it takes a deeper tint than the tissues when stained with haematoxylin. The nucleus of the infected cell is situated near its base, and occasionally shows a concavity when the amoeba is in close proximity. The parasite begins to grow here, accompanied by a reaction on the part of the cell which hypertrophies, squeezing the cells in the immediate vicinity. The nucleus of the cell undergoes a change, its chromatin becoming segregated into small unequal granules which stain badly. Mitotic figures occur in the adjacent cells. An infiltration of polymorphonuclear leucocytes takes place in the surrounding tissue.

The amoeba eventually completely occupies the place of the cell, either totally devouring it or expelling the residue, which takes up a position above it in the lumen of the gland. Red blood cells are usually not ingested at this stage. When several parasites grow alongside one another desquamation of the cells *en bloc* may ensue. The vessels dilate and red corpuscles invade the tissues, where they are phagocyted. The process of destruction spreads through the muscular mucosa to the submucosa. The intestinal epithelium in the affected areas having disappeared, most of the amoebae fall into the lumen of the gut. Some however, and these are the small types, penetrate inwards. Whether the interglandular tissue of the mucosa becomes extensively infected or not depends upon the position of the developing amoeba. If in a cell near the deep end of a gland, direct infection of the submucosa through the muscularis mucosa is easy, but if its site is a cell situated at the side of the gland lumen the distance is considerable and the surrounding connective tissue is more liable to infection.

A secondary bacterial infection of the necrotic areas is an inevitable consequence of the process.

The lesions are generally very limited, forming islands in normal tissue, which explains the fact that the amoebae are not present in every sample of faeces examined. Considerable oedema of the submucosa is found. In the absence of a secondary infection it is not common to meet with chromatolysis of the nuclei of the leucocytes, which is such a characteristic feature of bacterial infections. The muscularis mucosa is partly destroyed. The cellular elements surrounding the invaded areas undergo a coagulation necrosis and it is when these break down that the greatest number of amoebae are found in the stools.

E. E. A.

REINHARD (P.). **Röntgenbefunde bei klinischer und experimenteller Amöbenruhr.** [Revelations of X Rays in Clinical and Experimental Amoebic Dysentery.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1916. June. Vol. 20. No. 11. pp. 245–260. With 3 plates.

The substance used to produce shadows was barium sulphate. After a preliminary clearing of the bowel, injections of $BaSO_4$, 300 gm., together with Bolus alba, 100 gm., in 1·5 litres of water were given, as well as Günther's barium sulphate broth by the mouth.

The site of election of amoebae in the bowel is naturally where the flow of the liquid contents is least, namely at the ileo-caecal valve and flexures. Insufficiency of the valve in cases of amoebic dysentery is a fairly common occurrence, the sign of which is tenderness on pressure in the appendix region. Stenosis is a frequent accompaniment of insufficiency, leading to delay in the passage of the contents of the small into the large gut. This can be readily demonstrated experimentally in the cat, which animal can be easily infected with *E. histolytica.* Normally nearly all the barium should have passed into the large intestine in three hours; in five hours the small intestine should be quite clear. In the case of an amoebic cat it is found that all the barium is still in the small intestine after three hours. Amongst other lesions detected by the same method was a conical contraction of the caecum.

E. E. A.

Dobell (Clifford). **Incidence and Treatment of** ***Entamoeba histolytica*** **Infection at Walton Hospital.**—*Brit. Med. Jl.* 1916. Nov. 4. pp. 612-616.

This careful investigation deals with 200 New Zealanders from Egypt and Gallipoli who were admitted to the Walton Hospital. Of these 130 were suffering from dysentery, enteric or other intestinal ailments, or from debility following these. The remaining 70 had been taken in for wounds or affections other than intestinal ones. The following table shows the protozoal findings:—

Number of men infected with:—

Entamoeba histolytica	22 = 11 %
Entamoeba coli	84 = 40·9 %
Giardia (= *Lamblia*) *intestinalis*	40 = 19·5 %
Chilomastix (= *Tetramitus*) *mesnili*	16 = 7·8 %
Trichomonas hominis	5 = 2·4 %
Isospora sp.	1 = 0·48%

Of the 22 cases in which *E. histolytica* was found, 11 were intestinal cases, and 11 wounded patients and those suffering from non-intestinal complaints. The next table gives further details:—

Percentages of Cases Infected with E. histolytica.

Intestinal cases..	8.2 per cent.
Dysenteric cases	10·0 „
Non-dysenteric cases	11·8 „
Non-intestinal cases	1·57 „

The salient point brought out by these examinations is that all the men returning from an amoebic district ought to be examined whether there is any suspicion of dysentery or not. Most of the men infected with the amoeba had definite histories of dysentery or diarrhoea. This failed however in at least two cases, who must therefore be regarded as contact carriers.

Twenty-one men infected with *E. histolytica* were treated with subcutaneous injections of emetine hydrochloride. A course of 12 to 14 gr. did not cure 14 of them; the remaining 7 were discharged as cured, examination of the stools proving negative for 2–3 weeks *after* treatment.

Next emetine bismuth iodide was tried, being administered by the mouth in cachets containing 1 gr., thrice daily until 36 gr. had been taken. There is a tendency to vomiting in some cases but tolerance is soon established if full doses are persisted with. All cases suffered more or less from diarrhoea, which should be looked upon as a salutary condition, effecting a removal of amoebae. Eleven of the 14 men who had not been cured by a course of emetine hydrochloride were subjected to this treatment. The other three received a second course of the hydrochloride so as to figure as controls. The results exceeded expectations. All the men who took the double iodide were more or less certainly cured while the three controls, who repeated their course of subcutaneous emetine hydrochloride, were none of them cured. Furthermore two of these controls (the third was not available, having left hospital) were subsequently cured by a course of emetine bismuth iodide, proving up to the hilt the superiority of the new preparation over the old.

The double iodide had no destructive action on other protozoa which happened to accompany *E. histolytica.* Although *E. coli* sometimes disappears from the faeces during treatment it almost invariably returns afterwards. On Lamblia and Chilomastix the drug had no effect whatever.

E. E. A.

JEPPS (Margaret W.). **Note on Some Examinations and Treatments for** *Entamoeba histolytica* **Infections.**—*Brit. Med. Jl.* 1916. Nov. 4. pp. 616–617.

The patients all came from the Mediterranean area. Out of a number of cases the data concerning 23 were sufficient to allow of a detailed analysis. The first Table shows the 9 cases which were discharged as cured by hypodermic injections of emetine hydrochloride.

TABLE I.

Case No.	Treatment.			Consecutive Negative Examinations.	
	Begun.	Ended.	Amount given.	Dates (1916).	No.
15	May 21 July 6	June 1 July 15	12 gr. 10 gr.	June 2. 9, 17 (relapsed June 21) July 15, 24, 27, 29, 31	3 5
18	Aug. 5	Aug. 17	12 gr.	Aug. 10, 16, 19, 23, 25, 28, 30; Sept. 1, 4, 6, 8, 11.	12
19	Aug. 5	Aug. 16	12 gr.	Aug. 14, 15, 18, 20, 23, 25, 28, 30; Sept. 1, 4, 6, 8.	12
29	Aug. 9	Aug. 20	12 gr.	Aug. 16, 23, 25, 28; Sept. 1, 4, 6, 8.	8
31	July 24	Aug. 2	10 gr.	Aug. 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 28.	11
35	Aug. 5	Aug. 16	12 gr.	Aug. 16, 18, 20, 22, 24, 26, 29, 31; Sept. 2, 5, 7.	11
36	Aug. 9	Aug. 25	14 gr.	Aug. 29, 31; Sept. 2, 7, 9, 12, 14, 16, 19, 21.	10
37	July 24	Aug. 2	10 gr.	July 31; Aug. 7, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 29, 31.	14

Twelve cases relapsed before the end of three weeks' examinations after treatment as shown by Table II.

TABLE II.

Case No.	Treatment.			Consecutive Negative Examinations.		Date of Relapse (1916).
	Begun.	Ended.	Amount given.	Dates (1916).	No.	
12	Aug. 5	Aug. 16	12 gr.	Aug. 5, 7, 9.	3	Aug. 8 [sic]
16	Aug. 5	Aug. 16	12 gr.	Aug. 12, 15, 23, 25, 28, 30.	6	Sept. 1
21	Aug. 5	Aug. 16	12 gr.	Aug. 14, 16, 19.	3	Aug. 8 [sic]
23	Aug. 6	Aug. 17	12 gr.	Aug. 22, 26, 29, 31	4	Sept. 2
25	July 24	Aug. 2	10 gr.	July 31; Aug. 1, 5, 7, 9, 11, 13, 15, 19.	9	Aug. 21
28	July 24	Aug. 2	10 gr.	July 31	1	Aug. 7
32	Aug. 5	Aug. 16	12 gr.	Aug. 7, 8, 14, 16, 18, 20, 24, 26, 29.	9	Aug. 31
33	Aug. 5	Aug. 16	12 gr.	Aug. 14, 16, 19, 21, 23, 24, 25.	7	Aug. 28
34	Aug. 5	Aug. 16	12 gr.	Aug. 8, 10, 12, 14, 16, 18, 20.	7	Aug. 22
38	Aug. 10	Aug. 21	12 gr.	Aug. 19, 21, 23, 25; Sept. 1, 4.	6	Sept. 6
39	Aug. 12	Aug. 23	12 gr.	Aug. 24, 26, 29	3	Aug. 31
40	Aug. 12	Aug. 23	12 gr.	Aug. 17, 18, 21, 23, 25, 28.	6	Aug. 30

Two other cases did not receive full treatment with emetine and one of them relapsed within the arbitrary period of three weeks after the last injection.

TABLE III.

Case No.	Treatment.			Consecutive Negative Examinations.		Date of Relapse
	Begun.	Ended.	Amount given.	Dates (1916).	No.	
17	June 29	July 8	3½ gr.	June 5, 17, 20, 27; July 3, 8, 14.	7	
30	June 25	July 19	8 gr.	July 22, 24, 27, 31; Aug. 7, 8.	6	Aug. 10

No. 17 was only observed for a week after cessation of treatment so that it is not known whether he relapsed or not.

After the injection of at least 10 gr. of emetine 12 out of 21 cases were certainly not permanently freed from *E. histolytica.* The next table gives some additional information.

TABLE IV.

Case No.	After Emetine.	Day when First Found Negative.	Date of Detection of Relapse after End of Treatment.
15	12 gr.	First after end of treatment	Twentieth day.
16	12 gr.	Eighth day of treatment	Sixteenth day.
21	12 gr.	Tenth day of treatment	Fourth day.
23	12 gr.	Fifth after end of treatment*	Sixteenth day.
25	10 gr.	Eighth day of treatment	Nineteenth day.
28	10 gr.	Eighth day of treatment	Fifth day.
32	12 gr.	Third day of treatment	Fifteenth day.
33	12 gr.	Tenth day of treatment	Twelfth day.
34	12 gr.	Fourth day of treatment	Sixth day.
38	12 gr.	Tenth day of treatment	Sixteenth day.
39	12 gr.	First after end of treatment	Eighth day.
40	12 gr.	Sixth day of treatment	Seventh day.

* Not examined between eleventh day of treatment and this date.

E. E. A.

BAYMA (Theodore). **Traitement de l'amibiase par l'adrénaline.**—*Ann. Paulistas de Med. e Cirurg.* 1916. Aug. Vol. 7. No. 2. pp. 28–40.

The author has now had experience of 60 cases of amoebic dysentery treated with adrenalin. Of these 28 were acute and were cured after 2–15 days' treatment; the remaining 32 chronic cases, some of which were of more than two years' standing, were cured in 2–30 days. Young and old alike were treated in this way. Children under 1 year received up to 1 mgm. in 24 hours (5 drops four times a day), while in the case of adults 20–30 drops were administered every two hours. In the old-standing obstinate cases a large daily intestinal wash was prescribed as well. Intolerance to the drug was met with only twice—30 drops caused immediate gastralgic pains in two women.

Having had such good results in ordinary amoebic dysentery with adrenalin, Bayma was anxious to see if the treatment would also be useful in cases of liver abscess. The first case cited was that of a woman of 30. Chocolate-coloured pus, containing amoebae, was aspirated from her liver. She was started with 10 drops of adrenalin (Parke Davis 1 : 1,000 solution) every two hours for 14 hours when the dose was increased to 30 drops. The dysenteric condition (blood and tenesmus) rapidly ameliorated, the bulging of the thoracic wall decreased, and the patient was cured in 22 days.

Adrenalin was given in conjunction with emetine in another case of liver abscess which had been opened by the surgeon. The patient left the hospital cured, 20 days after the operation. The part taken by the adrenalin in the cure of this case is of course inconclusive. In the author's opinion adrenalin can transform a "living" into a "dead" abscess in the same way as emetine does, but it cannot bring about the absorption of the pus and should therefore always be accompanied by surgical measures.

Another patient who was benefited by adrenalin was a man who developed pain and tenderness in the right iliac fossa. He had dysentery, and amoebae were found in his stools. The case was diagnosed as appendicitis complicating dysentery. Adrenalin by the mouth soon reduced the number of stools and the patient got quite well without surgical interference.

The combined administration of two drugs is becoming increasingly popular, at any rate in diseases due to protozoa and spirochaetes where there is reason to believe drug-fast strains occur. For instance most authorities are now in favour of combining mercury and salvarsan in the treatment of syphilis. Many instances are now on record of amoebic dysentery cases which are refractory to emetine, and therefore the simultaneous administration of emetine and adrenalin is advisable.

[Some of the cases refractory to emetine have lately been cured by the new double iodide of bismuth and emetine which is now on its trial, so that the theory of emetine-fastness has not such a sound foundation as was originally assumed.]

E. E. A.

Calle (Miguel M.). **La creosota en la disenteria cronica amibiana.** [Creosote in Amoebic Dysentery.]—*Revista Clinica.* Medellin. 1916. Sept. Vol. 1. No. 2. pp. 73–75.

A recommendation to use rectal injections of creosote, in cases of amoebic dysentery in which, for any reason, emetine cannot be employed, or has been employed unsuccessfully. Notes are given of the case of a woman, who had been treated unsuccessfully for amoebic dysentery with injections of emetine. The patient was ordered five doses of 5 gm. of sulphate of soda, at half an hour's interval, and was then directed to take every morning, after washing out the bowel with an injection of warm water, the following enema :—

Beechwood creosote	4 gm.
Glycerine	15 ,,
Warm water to	500 cc.

On this treatment the daily stools fell from 17 in the day and 5 in the night, to two in the day and none in the night, after four injections. Improvement began after the second injection, and at the end of 10 days the patient felt perfectly well. The treatment was followed up, by way of precaution, with 10 subcutaneous injections of emetine of 4 cgm. each.

The author has employed the same treatment in three other cases, with complete success in two and a failure in the third, the latter for special reasons.

J. B. N.

Justi (K.). **Amöbenruhr und Amöbenabszess der Leber mit Durchbruch in die Lunge.** [Amoebic Dysentery and Amoebic Abscess of the Liver bursting into the Lung.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1916. June. Vol. 20. No. 12. pp. 268–274. With 2 text-figs.

An account of a single case of liver abscess. A brief history of the patient is as follows. The liver abscess was opened at the close of the year 1912. In the course of the next year a periproctitic abscess developed and was drained. About February 1915 he began to be troubled with a cough. On July 30th puncture of the right chest showed the presence of thick sterile pus. The leucocyte count was 9,700, 80 per cent. of which were polymorphonuclears. A rib was resected on August 6th allowing the escape of much green pus from the pleural cavity. The patient died on August 20th.

No amoebae were found in the pus of the empyema post mortem, nor in scrapings from the abscess wall. Sections were made which showed *E. histolytica* in the abscess wall, and in the submucosa of the large gut at the site of the ulcerated areas, as well as in the dilated veins and capillaries. In some of the sections the amoebae could be seen traversing the vessel walls. [No mention is made of the employment of emetine in addition to surgical measures. It has been shown that it is essential to combine both methods of treatment in order to obtain a radical cure.]

E. E. A.

WEMYSS (H. L. Watson). **A Case of Amoebic Abscess of the Liver.**—*Edin. Med. Jl.* 1916. Oct. Vol. 17. No. 4. pp. 255-258.

This man had an attack of dysentery in Gallipoli from which he temporarily rallied, two injections of emetine being administered. Later he went sick again with what was diagnosed as typhoid fever on account of the positive Widal reaction, but he had been recently inoculated against this disease, so that the conclusion drawn may have been erroneous, especially as no typhoid bacilli could be isolated from the blood, faeces or urine. He complained of pain in the upper abdomen and he was jaundiced. He was invalided home, and eventually developed a liver abscess which contained chocolate-coloured pus and was evacuated. A few doses of emetine were given and the patient made an uneventful recovery. Although the case was undoubtedly amoebic in origin, the organism could not be demonstrated either in the pus or in the wall of the abscess after careful search.

E. E. A.

MATHIS (C.) & MERCIER (L.). i. **Les kystes d'*Entamoeba dysenteriae*.**—*C.R. Soc. Biol.* 1916. Nov. 18. Vol. 79. No. 18. pp. 980-982.

ii. **La division simple chez** *Entamoeba dysenteriae*.—*Ibid.* pp. 982-984.

iii. **L'Amibe de la Dysenterie,** *Entamoeba dysenteriae*, **Councilman et Lafleur 1891.**—*Bull. Inst. Pasteur.* 1916. Nov. 15. Vol. 14. No. 21. pp. 641-663. With 2 figs.

The first paper deals with the cysts of the entamoeba of dysentery, which the authors term *E. dysenteriae*. In order to determine the sizes of the cysts, a hundred were examined in stained preparations. In such preparations the cysts were found to vary from 8μ to 12·5μ. The living fresh cysts gave extreme dimensions of 10μ to 15μ, the most common forms being 12·5μ and 14μ. Cysts of 10μ in stained preparations are considered to be microcysts, and those of 11·5μ macrocysts. Vacuoles are present in the cytoplasm at the commencement of encystment. The chromidium, which is of cytoplasmic origin, is formed by the aggregation of granules around the vacuoles which gradually disappear. After the formation of the chromidia, the nucleus undergoes mitosis and, after a time, the daughter nuclei divide again, four nuclei being thus formed. It is remarked that the chromidium is not a constant feature, being absent in about ten per cent. of the cysts, both uninucleate and tetranucleate cysts showing the absence of this structure. No sexual phenomena have been seen, but it is suggested that the cysts termed microcysts and macrocysts may represent gametocytes.

The second paper relates to division of *Entamoeba dysenteriae*, as the excitant of amoebic dysentery is termed. The authors consider that the Entamoebae of the *tetragena* type and the corresponding cysts alone take part in the cyclical development of the parasite, and that the *histolytica* forms are aberrant, appearing at the crises. Division of the *tetragena* form within the host is said to be by a mesomitosis, and not a mitosis as stated by JOB and HIRTZMANN. Contrary to the opinions of many authors, Mathis and Mercier think that dysenteric Entamoebae of the type *histolytica* have lost the power to multiply, as they have not found division forms in the stools examined [but this does not agree with their diagrammatic life-cycle in their third paper]. The presence of large numbers of *histolytica* forms in stools is explained by assuming the transformation of *tetragena* forms into *histolytica* forms. The authors have not seen schizogonic parasites and do not believe that schizogony occurs.

The third paper deals in a general manner with the amoeba of dysentery, and covers some of the same ground as the preceding ones. The authors prefer the generic name Entamoeba to Endamoeba, and attempt to re-establish the specific name *dysenteriae* for the pathogenic Entamoeba. It may be stated that the arguments advanced are not very convincing, and are in part based on the assumption that the entamoeba originally observed by LÖSCH was the pathogenic form which he named *E. coli*. Consequent on the confusion with the organism now known as *E. coli*, the name of the species is given as *dysenteriae*. According to the authors the genus Entamoeba is polyphyletic. An account is given of the *histolytica* and of the *tetragena* forms of the Entamoeba. The motile *tetragena* form shows a vesicular nucleus about 4μ to 5μ. A karyosome with a centriole is present. Division is simple and is mesomitotic. The cysts are characterised by the presence of four nuclei and chromidia, and the sweeping generalisation that their presence in faeces allows of the "unhesitating" diagnosis of amoebic dysentery is made. [The authors have overlooked the fact that sometimes *E. coli* has four nuclei and occasionally contains chromidial masses.] The *histolytica* form is said to occur only in muco-sanguinolent stools and in abscesses of amoebic origin. The motile form is usually from 25μ to 40μ, and contains phagocytosed erythrocytes. [These enclosures are not always present.] After the digestion of the red cells, the endoplasm shows a greenish tint which, it is suggested, may be due to a pigment such as biliverdin. The degeneration forms of *E. histolytica* described by SCHAUDINN as "spores" are discussed.

The authors consider differential characteristics between *Entamoeba coli* and *E. histolytica*. Their views are those generally held, and relate to the ingestion of red blood corpuscles, separation of ectoplasm and endoplasm, the structure of the nucleus and the differences in the cysts. The authors are of the opinion that the Entamoebae are best distinguished in their cystic stages, and they point out—as is well known—that the larger size of the cysts of *E. coli*, the greater thickness of the cyst wall and the presence of a larger number of nuclei (8) are useful distinguishing features. As dimensions for cysts of *E. coli* they mention 16μ to 19·5μ diameter, for those of *E. histolytica* they mention 10μ to 15μ diameter in the fresh state. [In their figure of a cyst of *E. coli* they do not represent a thick cyst wall.]

Dysenteric stools containing cysts were kept in moist chambers and attempts were made to cultivate the entamoeba, but no additions to our knowledge resulted therefrom. It is also noted that in experimental infections in animals it is the *histolytica* type of the parasite which multiplies. Yet the authors think that there is no evolution, properly so-called, of the parasite in animals but only a simple culture *in vivo*, in which degeneration forms abound, though it is acknowledged that cysts have been obtained in the cat by certain workers.

In conclusion, the authors consider the life-cycle of *E. histolytica* as a whole. They think that four amoebulae emerge from ripe cysts [but see this *Bulletin*, Vol. 8, pp. 116–117]. They find that *histolytica* forms preponderate in bloodstained mucus, while *tetragena* forms occur in faecal matter only. They think that the monkey as an experimental animal would be more likely than the cat to show the normal life-cycle of the parasite. A life-cycle diagram is given, but this contains nothing essentially new.

[Regarding the specific name *dysenteriae* given by COUNCILMAN and LAFLEUR in 1891, it is interesting to note that CALKINS considers that the name was inadequate and insufficient to identify the organism with which they were working. CRAIG states that *dysenteriae* is considered by STILES to be a synonym of *coli*.]

A. Porter.

MACFIE (J. W. Scott). **Observations on Urinary Amoebiasis.**—*Ann. Trop. Med. & Parasit.* 1916. Dec. 16. Vol. 10. No. 3. pp. 291–304.

The author, after giving an historical survey of the cases of amoebae found in urine previously reported, describes three cases seen by him at Accra, Gold Coast Colony. Two of the patients were negroes, and little is known of them, as only a single specimen of urine from each of them was examined, though these specimens contained amoebae.

The third case was that of a European and was brought, already diagnosed, to the author's notice by Dr. C. V. Le FANU, who also provided notes of the case. The patient was an official, 27 years of age, who in May last complained of frequency of micturition and the passage of white deposit with his urine. In the urinary deposit pus cells, epithelial cells, erythrocytes and amoebae were found at various times. He had never suffered from dysentery, but had had " a slight diarrhoea in November, 1914, lasting for eight days." Although there were reasons for suspecting gonorrhoea, gonococci were never found. On rectal examination, both seminal vesicles were found to be enlarged, but the testicles and epididymis were normal. Treatment by rectal massage of the vesiculae and hypodermic injection of ½ gr. of emetine daily was given, and the patient was cured by the third week in August. [The total amount of emetine given is not apparent.]

The morphology of the parasite is described in detail. The amoebae ranged in size from 7μ to 33μ, a few reaching 40μ. Cysts containing as many as four nuclei were found. The nucleus, as found in the various parasites, varied somewhat, but it was usually of the type seen in *Entamoeba tetragena*, with karyosome and centriole. The author believes that the amoebae " cannot be differentiated from *Entamoeba histolytica* (*tetragena*)." As regards the probable mode of infection, the author thinks that the parasites may have come from the large intestine of the patient.

Reference is made in the paper to the bodies seen by WARD, COLES and FRIEL and commented on by FANTHAM [see this *Bulletin*, Vol. 8, p. 118].

A. P.

BRUG (S. L.). **Pigment und andere Einschlüsse in Dysenterieamöben.** [Pigment and Other Inclusions in Dysenteric Amoebae.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1916. Sept. Vol. 20. No. 18. pp. 433–436. With 4 figs.

The author, a medical officer in the Netherlands East Indies army, has found certain pigmented amoebae in sections of the wall of a liver abscess. These were not constant throughout the section, being abundant in some parts and sparse in others. At first the pigment was considered to be the remains of erythrocytes, but comparison with amoebae containing numerous erythrocytes only recently ingested showed that there were differences between them and the pigment. Their staining reactions were also different.

Pigment masses were found to be present in some of the cells of a normal liver. The author thought that it was possible that the amoebae had phagocytosed the pigment of the liver cells after the death of the latter, owing to the action of a histological ferment. It was improbable that they could have ingested entire liver cells. In the case examined, many phagocytosed leucocytes were found in the amoebae, and the degree of digestion was shown by the nuclei of the lymphocytes lying in a large vacuole. The author finally considers that it is possible that the pigment in the amoebae has been derived from ingested leucocytes which originally obtained it from liver cells.

Sometimes a large crescentic pigmented mass has been seen in some amoebae. It is suggested that this is either a large chromidium or an agglomeration of phagocytosed erythrocytes.

The drawings show the appearance presented by these pigmented amoebae.

A. P.

MITCHELL (O. W. H.), CULPEPPER (W. L.) & AYER (W. D.). *Endameba buccalis* **in the Mouths of Institutional Children.**—*Jl. Med. Res.* 1916. Sept. Vol. 35. No. 1. Whole No. 158. pp. 51–53.

During the winter of 1915–16, 1,000 smears from the mouths of 500 children, inmates of an orphans' home and an institution for the feeble-minded, were examined by the authors for *Entamoeba buccalis*. Superficial and deep smears were taken, the former without any preliminary cleansing of the gums. The gums were classified as (i) normal, (ii) receding, and (iii) receding, spongy and bleeding. Very few of the third group were true cases of pyorrhoea, suppurative gingivitis more accurately describing the conditions. Of children with normal gums, 58 contained *E. buccalis* and 211 were negative. The organisms were thus present in 21·6 per cent. In cases with receding gums, 61 were infected and 37 free, there being thus 62·2 per cent. infected. Of those with receding, spongy bleeding gums, 99 were infected and 34 uninfected. These results are very like those obtained by WILLIAMS and colleagues [see this *Bulletin*, Vol. 7, pp. 205–6] and a table is given comparing the two sets of results. There was little difference in the findings among children of different ages.

A large proportion of normal mouths were thus found to contain *E. buccalis.* "The more marked the pathological condition of the gums the greater are the chances of finding endamebae." Of the 218 children with positive results, the organisms were present in only superficial smears in 63, in only deep smears in 23, and in both superficial and deep smears in 132. In the latter case, the organisms were usually more numerous in superficial smears. The authors think that perhaps *E. buccalis* is of doubtful pathogenicity. [The name *E. gingivalis* has now superseded that of *E. buccalis* on the score of priority.]

A. P.

HECKER (F.). **Experimental Studies with** *Endamoeba* **Gros.**—
Jl. Infect. Dis. 1916. Nov. Vol. 19. No. 5. pp. 729-732.

The author has made a study of entamoebae found in the human mouth. In order to obtain the organisms, a loop of cotton wool was passed into the deepest portion of the root socket of a diseased tooth, and was moved upwards, downwards and laterally, so as to collect specimens from the entire area of disease. Care was taken to avoid bleeding, as then the specimens would contain erythrocytes and not pus. The loop was withdrawn and the contents mixed with a drop of sterile salt solution on a clean slide, covered and examined microscopically. By a special procedure, amoebae were isolated, after which each was washed three to five times in sterile broth to remove debris and bacteria. When the entamoebae were considered clean, they were removed and inoculated into the "deepest portion of the gingiva" of a guinea-pig. Six guinea-pigs so treated were examined daily. "With the exception of three guinea-pigs which showed slight inflammation of the gingivae on the second and third days respectively, none of the animals disclosed inflammation, pus, or presence of entamebas during a period of 84 days following the inoculation."

The author also injected active entamoebae into the gingival space around the "six lower anterior teeth and the four anterior upper teeth" of his own mouth, the teeth previously being free from entamoebae. The largest number of entamoebae injected was 14.

Microscopic examinations were made after the seventh day, inoculations being continued at five-day intervals. From March 12th to August 1st, 1916, "no inflammation of the gum had occurred, and no pus, and no entamebas had been found microscopically." From his experiments the author cannot accept the view that the entamoebae found in the pus at the root of a tooth affected with pyorrhoea alveolaris are the etiologic agents of the malady.

A. P.

BACILLARY DYSENTERY.

DELILLE (Armand), PAISSEAU & LEMAIRE. **Note sur une épidémie de dysenterie bacillaire à l'armée d'Orient.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1916. July 27. Vol. 32. 3rd Ser. No. 25-26. pp. 1302–1308.

During May and June 1916 an epidemic of bacillary dysentery occurred amongst the troops at Salonika. In 240 examinations of faeces, *E. histolytica* was never found, nor even *E. coli.* In 133 cases nothing beyond *B. coli* or its close allies was found. *B. dysenteriae* Shiga was isolated 11 times. In addition to these, types were met with which fermented the same sugars as Flexner, Shiga or His respectively but accompanied by the production of gas. No agglutination of these bacilli was obtained with specific sera. They were obtained from typical dysenteric stools and the authors look upon them as approaching closely the dysentery group of organisms. If they were known certainly to be pathogenic, they might be called para-dysentery bacilli.

Bacilli the characters of which deviated considerably from those of the dysentery group, were neglected.

A bacillus answering to the description of Morgan's No. 1 was isolated seven times.

[The authors wax enthusiastic over the finding of Morgan's bacillus, and other bacilli closely allied to the dysentery group, but it is necessary to be extremely cautious in regarding them as pathogenic. The most important piece of information is lacking, namely whether the patient's serum agglutinated the respective bacillus.]

E. E. A.

LEVADITI (C.) & NICOLAS (G.). **Recherches sur la dysenterie.**—*C. R. Soc. Biol.* 1916. Oct. 21. Vol. 79. No. 16. pp. 839–843.

At the garrison of Orleans a dysentery epidemic broke out. Bacteriological examinations were made on 110 stools, from 25 of which Gram negative, non-motile bacilli were isolated which did not ferment lactose. Of this number only 12 could be relegated to known types—*B. dysenteriae* Y, 9 cases; *B. dysenteriae* Strong, 3 cases. The remainder were put out of court by their agglutination reactions or by their action on sugars and neutral red agar.

It was found that each bacillus isolated which fermented sugar according to the Y or Strong types and in addition did not change neutral red, showed all the other characters of the group to which it belonged. It was agglutinated not only by the test serum, but also by the serum of dysentery convalescents. On the other hand the bacilli which gave anomalous sugar reactions *and all of which without exception fermented neutral red agar* were agglutinated neither by the serum of the patient from whom they were isolated, nor by the serum of other dysentery patients or convalescents. They had no relation whatever to the disease.

E. E. A.

FEJES (Ludwig). **Ueber Typhus und Ruhrmischinfektion.** [Mixed Typhoid and Dysentery Infections.]—*Med. Klinik.* 1916. Sept. 10. Vol. 12. No. 37. pp. 974–976.

Patients who are simultaneously infected with both typhoid and dysentery bacilli, exhibit clinical manifestations of dysentery first, on account of the shorter incubation period. In the cases observed by Fejes the usual course of events was that during the third week of the dysentery attack, that is to say, when the symptoms were becoming mild, the typhoid infection started with a rise of temperature. The patients on the whole did well, which was doubtless due to the fact that the dysentery was mostly of the Flexner type. Very different however was the result when the sequence was inverted, namely when dysentery followed or rather appeared during an attack of typhoid fever. All the cases in which the diagnosis was supported by bacteriological investigation terminated fatally, irrespective of the type of dysentery. With the onset of the second infection the temperature suddenly becomes subnormal, bradycardia is followed by tachycardia, in a word collapse sets in, which rapidly terminates in death.

E. E. A.

SCHIEMANN (O.). **Ueber Schwierigkeiten bei der serologischen Diagnose der Shiga-Kruse-Ruhr und über Modifikationen der Technik der Agglutination.** [Difficulties in the Serological Diagnosis of Shiga-Kruse Dysentery and Modifications of the Technique of Agglutination.]—*Berlin. Klin. Woch.* 1916. Sept. 25. Vol. 53. No. 39. pp. 1079–1080.

There has lately been much discussion as to the possibility of a prophylactic typhoid or cholera inoculation inducing the formation of group agglutinins for Shiga bacilli. Apropos of this the author remarks that he has tested a number of dysentery patients' sera on two different Shiga strains. One of these strains showed group agglutination with a typhoid serum (from horse). It is necessary therefore to choose a Shiga strain which does not exhibit such group agglutination by testing it on many different normal and immune sera.

As the result of testing a large number of patients' sera on typhoid, paratyphoid B, Flexner Y and Shiga bacilli the author concludes that a 1 : 100 dilution of the serum is necessary before a probable diagnosis of Shiga dysentery can be entertained, whenever typhoid or paratyphoid agglutinins are also present (whether by inoculation or not). A 1 : 50 titer may be due to group agglutinins. A positive Shiga agglutination therefore always has a greater value if the simultaneous presence of typhoid and paratyphoid agglutinins can be excluded, but on account of the extra labour involved this is seldom practicable in routine work .

Another point lately insisted on by several authors is that specific Shiga agglutination is always in the form of coarse clumps. A fine grade agglutination is to be neglected as unspecific. More recently JACOBITZ has reported coarse clumping in a 1 : 50 dilution in a number of cases which were not dysentery. This question is therefore not yet finally settled. The author points out that the distinction between coarse and fine clumping is only valid when the tube is not shaken. The ordinary efforts to dislodge the sedimented bacteria are sufficient to break up the big irregular clumps. A rotating motion which is just enough to project the sediment into the body of the fluid again, is all that can be allowed.

Out of 23 Shiga strains tested 21 showed the phenomenon of coarse clumping; the other two only exhibited fine clumping, so that it is not universal. In addition a definite optimum was obtained at a dilution of 1 : 50 with the patient's serum used. Dilutions of 1 : 10 and 1 : 20 gave distinctly less coarse clumping.

E. E. A.

MEYER (F.). **Ruhr und Ruhrbehandlung.** [Dysentery and its Treatment.]—*Berlin. Klin. Woch.* 1916. Sept. 25. Vol. 53. No. 39. pp. 1070–1076.

The author divides his cases into two main groups. The first group consisted of mild cases in East Prussia. Stomach symptoms were to the fore, no deaths were recorded and in most instances no dysentery bacilli were isolated. In all probability this epidemic was not true dysentery at all but was due to sudden change of diet coupled with exposure or some other such factor.

The second group occurred in Russia and the cases were of a more serious type. They could be subdivided into mild, medium and severe. The mild cases differed from those of the previous group, chiefly in the absence of stomach symptoms. About a third of them developed fever. Flexner-Y bacilli were isolated from the faeces of 10 of the cases. All the stools contained slime ; 70 per cent. contained blood also. Amongst the severe cases the usual complications were observed, such as rheumatism, polyneuritis, nephritis, myocarditis, bladder trouble, pleuritis and periproctitis with abscess formation. The rheumatism often persisted for 4–5 months.

Anti-dysentery serum was used. To be effective it must be given early—during the first, or at latest second week. Only intramuscular or intravenous injections were resorted to. The serum is absorbed much quicker by the muscular route than when injected under the skin and as time is a matter of great importance this method should be given precedence. The dose used was 50 cc. or in bad cases 100 cc. The intravenous route is the ideal and was used where possible, 20 cc.

or even 30 cc. of serum being injected at one time. On account of the danger of anaphylaxis it can only be employed, however, in patients who have never previously had an injection of horse serum (diphtheria antitoxin, antistreptococcic serum, tetanus antitoxin, etc.). The large number of medicaments recommended for the local treatment of dysentery shows that there is no sovereign remedy from this point of view.

E. E. A.

MIXED AND UNCLASSED DYSENTERY.

FRASER (Henry). **The Bacteriology of Dysentery in Malaya.**—*Studies from the Inst. Med. Res. Federated Malay States.* No. 13. 44 pp. 1916. Singapore : Kelly & Walsh, Ltd., Printers. [Price 3*s.* 6*d.*]

A summary of this work is best given in the author's own conclusions which are as follows :—

" 1. Amoebae were found in the stools of 249 out of 819 cases of dysentery admitted to District Hospital, Kuala Lumpur, during the years 1914 and 1915.

" 2. The stools of 63 out of 249 cases of amoebic dysentery were examined bacteriologically. 19 cases were dealt with during the first investigation and dysentery bacilli were isolated twice. 44 were dealt with during the second investigation and dysentery bacilli were not isolated.

" 3. The stools of 172 out of 570 cases of non-amoebic dysentery were examined bacteriologically. 105 were investigated during the period extending from the 15th May to the 15th August, 1914, and 67 were investigated during the period extending from the 1st August to the 31st December, 1915.

" 4. Dysentery bacilli were isolated from the stools of 72 out of the 172 cases, being 44 out of the 105 in the first series and 28 out of 67 in the second series.

" 5. Dysentery bacilli of the Shiga type were isolated from the stools of 8 cases.

" 6. Mannite-fermenting dysentery bacilli were isolated from the stools of 64 cases.

" 7. The mannite-fermenting dysentery bacilli were not separable into varieties or types.

" 8. The reactions of the mannite-fermenting dysentery bacilli on maltose, saccharose and dextrin are subject to great variations and the results should not be used for classification or for the creation of types.

" 9. The dysentery bacillus of Flexner, the bacillus ' Y ' of Hiss and Russell and Strong's bacillus are not distinct types. These names should therefore be abolished ; their retention can only perpetuate the confusion. They should be known collectively as the mannite-fermenting dysentery bacilli.

" 10. The dysentery bacillus of Flexner and the bacillus ' Y ' of Hiss and Russell can ferment sorbite ; the reaction on this substance cannot therefore be used for the purpose of classification.

" 11. The comparison by means of sugar-reactions of freshly isolated strains of mannite-fermenting dysentery bacilli with those which have been isolated for some time or with those isolated by other workers is unsound.

" 12. The reaction of the patient's serum with various strains of dysentery bacilli may be negative in cases from which dysentery bacilli have been isolated.

"13. The disease associated with the mannite-fermenting dysentery bacilli does not differ from the disease associated with the *Bacillus dysenteriae*, Shiga. The term pseudo-dysentery should therefore be abolished."

E. E. A.

IZAR (Guido). **Diarrea e dissenteria nelle armate in campagne con speciale riguardo alla terapia.** [Diarrhoea and Dysentery in Armies in the Field with Special Reference to Therapeutics.]—*Riforma Med.* 1916. Nov. 13. Vol. 32. No. 46. pp. 1257-1265. With 6 charts.

The author divides gastro-intestinal disorders, as seen in soldiers, into three groups: (1) simple diarrhoea, (2) chronic diarrhoea, similar to that met with in tropical climates, and (3) bacillary dysentery proper. The first type has a sudden onset, as the result of chills, the drinking of cold water, prolonged marches, or excessive or unsuitable feeding. The patient is taken with cramps in the abdomen, accompanied by the passage of liquid motions containing neither blood nor mucus. The bacterial flora of the intestine is normal in these cases, and is often reduced in amount. Removal from the ranks and rest, with a milk diet and the administration of opiates and astringents, quickly repress the symptoms.

The second form is characterised by the stools being principally composed of greenish mucus, often frothy and containing flakes of whitish material, which is suspended in a yellowish liquid of acid reaction and sour smell. Under the microscope particles of this mucus are seen to contain cellular elements, more or less disintegrated, along with numerous leucocytes, and many Gram-negative bacteria and infusoria. The flakes are seen to consist of clumps of bacilli surrounding fragments of food material, while chemical tests show that the green colour is due to unaltered bile. When left to stand in a vessel, the liquid separates into three layers, of which the upper one consists of a frothy greenish layer of acid smell, while the middle is composed of a turbid yellowish fluid, and the lowest consists of mucus. Probably the condition is due to a simple inflammatory catarrh of the ileo-caecal mucous membrane, due to the action of an excessive quantity of common saprophytic bacteria, the presence of unaltered bile-pigment showing that the inflammatory process is limited to the ileo-caecal portion of the intestine, by which the normal reduction of the bile pigments to stercobilin is prevented. If these patients are kept for from 24 to 36 hours on a fluid diet, without any other medicine than lime-water diluted with mineral water, the stools soon return to their normal condition; but an intense irritability of the mucous membrane of the bowel usually remains, as is shown by the tenderness of the abdomen and the proneness to relapse. Patients with this form of diarrhoea should be kept quiet and suitably dieted for at least a week.

The specific cause of the third variety of diarrhoea is the dysentery bacillus. Of 170 cases of this affection observed by the author, as many as four-fifths came from a single division of soldiers who occupied a single line of trenches, in which previously no cases of the kind had occurred, the inference being that these soldiers brought the infection with them. By appropriate measures the outbreak was quickly subdued. The epidemic under consideration was unusually benign, there being only one death in 170 cases, a fact which may be attributed to promptness in treatment. This type of bowel complaint is distinguished by a premonitory period lasting from 4 to 10 days, which is characterised by lassitude, loss of appetite, weakness and pains in the joints and limbs; sometimes, however, this preliminary stage is wanting. It is followed by the onset of colicky pains, occurring chiefly in the afternoon, which are followed by actions of the bowels, accompanied at times by nausea and vomiting. The author goes on to describe the subsequent course of the disease, with the aid of several clinical charts. The histories of six typical cases are given in full. The disease continues at its acme in these cases for from 4 to 20 days before convalescence sets in. Two of the cases treated showed typhoid symptoms, and in another there was gangrene of the bowel with severe collapse.

The treatment found most efficacious by the author was the administration of the mixture of charcoal and kaolin, recommended by Ascoli, in doses ranging from 20 to 60 gm., suspended in water or milk. In the graver cases recourse was had to serum therapy and afterwards to vaccines, of which the former did not give the good results expected, while the latter proved very satisfactory, provided that endovenous injection was employed. The vaccine was prepared by the author from material taken from the patients, according to the Pfeiffer-Kolle method, of such a strength that 1 cc. of the vaccine contained one-thousandth of a loopful of an ordinary agar-culture. The general dose for injection was 2 cc. of this solution, equal to 1/500th of a loopful. Local treatment of the bowel through a rectoscope was also successfully employed, and in the gangrenous case enemata of iodoform in oil, in a strength of 1 : 200, were used with benefit. To all the patients chlorhydrate of adrenaline was also given in order to relieve the griping pains and tenesmus, either by the mouth or by the rectum, the dose being 20 to 60 drops daily of a 1/1,000 solution. Evident benefit was obtained. The temperature charts in the text show very clearly the improvement which followed each dose of vaccine.

J. B. Nias.

Giroux (L.). **Dysenterie et diarrhées dysentériformes.**—*Presse Méd.* 1916. Sept. 14. Vol. 24. No. 51. p. 408. With 1 chart.

Amongst 150 cases of diarrhoea, there were 117 passing blood and mucus. The type of dysentery was mild as there were only five deaths. There seems to have been no pathological examination of the stools, but the failure of anti-dysentery serum led the author to try emetine, with good results. *E. histolytica* was presumably the chief cause therefore, of the epidemic.

In the definite dysentery cases a marked increase in the quantity of urine was an early sign of approaching convalescence. In the acute stage the quantity of urine passed in the 24 hours is small—about 500 cc. The convalescent period is ushered in by a sudden rise to 1,000, 2,000, or even 3,000 cc. of urine per diem. This increase is accompanied by the excretion of about 16 to 20 gm. of chlorides, and also by slowing of the pulse. A typical instance is shown in the chart reproduced here.

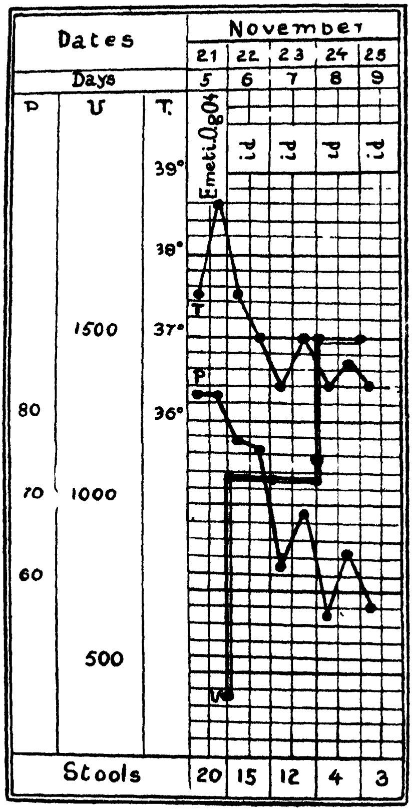

Chart illustrating effect of emetine on temperature, pulse, and excretion of urine in a case of dysentery.*

As regards medicinal treatment good results were obtained with cardiac tonics and morphined serum, the latter being especially helpful even in cases with marked albuminuria.

E. E. A.

NOC (F.). **Dysenterie bacillaire, dysenterie amibo-bacillaire et diarrhée chronique en Cochinchine.**—*Bull. Soc. Path. Exot.* 1916. Vol. 9. No. 9. pp. 709–723.

There is not very much bacillary dysentery in Cochin China. Of 219 cases during 1915, 173 were diagnosed amoebic dysentery, 19 bacillary dysentery, and 27 chronic diarrhoea. Anti-dysentery serum produces only temporary amelioration in mixed dysentery, but it may be the means of saving the patient if given in large doses early in the disease in conjunction with emetine.

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*Reproduced, by permission, from *La Presse Médicale.*

A case of dysentery complicated by ulcerative stomatitis is recorded which developed mental symptoms—delusions. The patient, a woman of 32, completely recovered. *E. histolytica* and *B. dysenteriae* Y were present in the stools. Dysentery in children is often confounded with other forms of gastro-enteritis. As it is even more infectious than in adults, bacteriological examination of the faeces of all suspects is very important.

To avoid serum trouble in children when repeated doses are necessary the following procedure was adopted. The first dose of antidysentery serum was injected under the skin. The next day the same dose (10 to 20 cc.) was introduced into the rectum together with 60 cc. sterile water. The anus is guarded by a tampon and the child's legs raised until the injection is absorbed, which takes place in about 20 minutes. If this is not retained the subcutaneous injections are continued. There is however not much chance of serious anaphylactic symptoms.

After the bacillary nature of certain forms of chronic diarrhoea had become evident, Noc employed a combined method of immunisation with good results, that is to say a vaccine was given as well as antidysentery serum. Young agar cultures of dysentery bacilli in tubes of 18 mm. diameter were emulsionised in 20 cc. of saline solution and heated for an hour at 51° C. Lately the author has used bacillary emulsions in oil—the oil of sweet almonds washed with alcohol and sterilised. These emulsions are absolutely painless when injected subcutaneously. The dose of these vaccines used was ¼ cc. to ½ cc.

E. E. A.

MAGNER (William). **Some Observations on Dysentery.**—*Lancet.* 1916. Oct. 21. pp. 703–707.

Two cases of infection with *E. histolytica* are noted in one of which *B. coli* was isolated from the blood; in the other, a member of the typhoid-colon group was found in the blood, giving acid in glucose as the only sugar fermentation.

As regards pathological findings bacillary dysentery differs radically from amoebic. In the latter it is common to find ulcers separated by areas of healthy mucous membrane, while in bacillary dysentery the lesion is of a diffuse nature, being due to the action of the toxin secreted by the Shiga bacillus, and is characterised by well marked submucous haemorrhage.

E. E. A.

von JAKSCH (R.). **Ueber einen Fall von Dysenterie aus unbekannter Ursache.** [A Case of Dysentery of Unknown Origin.]—*Zentralbl. f. Inn. Med.* 1915. Nov. 20. Vol. 36. No. 47. pp. 749–752.

A woman of 31 had partaken of roast hare which was not quite fresh. She developed an acute attack of dysentery, of which she died in three weeks. The patient's blood did not agglutinate any of the known dysentery bacilli and *E. histolytica* was also excluded. The autopsy confirmed the diagnosis of acute dysentery, the large intestine showing pseudo-membranous ulceration. The ptomaine group of substances was increased in amount in the urine—2·8 gm. of precipitate were obtained by treating 100 cc. of urine with benzoyl chloride. Toxins of the ptomaine class were probably the cause of this case of dysentery.

E. E. A.

THOMSON (J. Gordon) & THOMSON (D.). **A Preliminary Note on the Occurrence of Peculiar "Bodies" of probably Protozoan Nature frequently found in the Stools of Dysenteric Patients.**—*Jl. Roy. Army Med. Corps.* 1916. Nov. Vol. 27. No. 5. pp. 556–560. With 1 plate.

The authors describe certain structures which they found in the blood and mucus of dysenteric stools, in which entamoebae were not demonstrable. The work was apparently done in Egypt. The bodies were cellular and were of different types. Many of the cells were either round or oval and often possessed two nuclei of unequal size. The nuclei were spherical and sometimes contained on the internal periphery a lenticular mass of chromatin. Some of them had also a central karyosome. Some of the bodies possessed as many as four nuclei.

Another type of cell possessed a nucleus with a relatively large karyosome.

A third type of cell contained a large circular body in the endoplasm and two small circular masses of chromatin near it.

A fourth type of cell contained small bodies within it, five in number in the one illustrated; these are considered to be suggestive of schizogony. Large capsules were found in the same specimen, and were filled with numerous "spores," which were considered to be yeasts.

Another type of large cell was thought to be a connective tissue cell from the submucous layer. The cells are phagocytic and may ingest polymorphonuclear leucocytes, or possibly parasites.

The commonest bodies observed were rounded structures, which each contained a smaller rounded structure which may possibly have been of the nature of an ingested leucocyte or perhaps a Protozoon.

The authors cannot correlate these various structures.

A. P.

ELLIOTT (John B.). **Clinical Report of a Case of Diarrhoea apparently due to Flagellate Parasites.**—*New Orleans Med. & Surg. Jl.* 1916. Oct. Vol. 69. No. 4. pp. 308–311.

The author describes a case of persistent diarrhoea in a young woman in South West Louisiana. There were six motions a day during 1914, the disease having begun in March 1910. In May 1915 she "looked a typical picture of one suffering from pernicious anemia." No amoebae were found in the stools but numerous *Cercomonas hominis* occurred therein. The patient was given thymol in the dosage usual for hookworm. Bismuth enemata and emetine were also tried at times, as well as chenopodium and an infusion of pecan-nut shells. In November 1915 there was a small rectal ulcer. In March 1916, Cercomonad flagellates were still present, and no change was reported in May 1916, the date at which the report ends.

A. P.

SPRUE.

BROWN (Thomas R.). **The Gastro-Intestinal Findings in a Case of Sprue, with a Note on the Treatment based on these Findings.**—*Bull. Johns Hopkins Hosp.* 1916. Oct. Vol. 26. No. 308. pp. 289–291.

The article opens with quotations from other writers concerning the aetiology of sprue. A single case is here recorded by the author, the patient being a woman of 24 who had lived in Porto Rico. The interest of the case lies in the gastro-intestinal derangement. On admission to hospital at Baltimore the gastric contents were entirely free from hydrochloric acid and there was a marked diminution of pepsin. A quantitative examination of the pancreatic juice showed a complete absence of diastase and as far as could be determined, of trypsin and lipase also. She was put on dilute hydrochloric acid and large doses of pancreatin—30 gr. daily, together with calcium carbonate and a little tannic acid. She improved rapidly, the diarrhoea ceasing and the weight going up. In about eight months the gastric contents showed the normal quantity of hydrochloric acid and pepsin ; in the meanwhile the acid administered had been gradually reduced and finally discontinued without the appearance of unpleasant symptoms. The pancreatin ferment however was still absent from the faeces and on the stopping of the pancreatin for a few days the diarrhoea made its appearance again with the characteristic gray, frothy stool. Up to the time of writing the patient has to continue taking pancreatin.

E. E. A.

HALBERKANN (J.). **Harn- und Kot-Untersuchungen bei Sprue.** [Investigation of Urine and Faeces in Sprue.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1916. May. Vol. 20. No. 10. pp. 225–241.

The paper deals with the analysis of urine and faeces of a single case of sprue.

Urine.—A considerable quantity of indican was present, and also some unidentified substance which reduced Fehling's solution but was certainly not glucose. There was no albumin present. Urobilin and bile pigments were never found.

Faeces.—The stools were fermented and foul-smelling. Blood was never seen. Bile pigments were not found, but urobilin (hydrobilirubin) was detected or rather its precursor urobilinogen. This substance is also found in the faeces of normal individuals, both sucklings and adults, who are on a milk diet.

The average daily weight of the faeces was 598 gm. (39·4 gm. dried), compared with about 300–500 gm. as the weight of a normal semisolid daily evacuation.

The total fats found in the faeces are greatly increased in sprue. Normally on a mixed diet they should average 6–8 per cent. In sprue the fats constitute over 20 per cent. and usually 40–50 per cent. This is not due to the failure of the fat-splitting enzymes to do their work, but rather to the absorptive power of the upper parts of the intestine being interfered with.

E. E. A.

Schmidt (Adolf). **Heilung eines Falles schwerer Spru durch Sauerstoffeinläufe.** [Cure of a Severe Case of Sprue by the Introduction of Oxygen.]—*Zeitschr. f. Inn. Med.* 1916. Jan. 29. Vol. 37. No. 4. pp. 49–52.

A married woman, 30 years old, had a severe attack of sprue. A milk diet failed to ameliorate the condition. A fat-free diet was then tried with the same result. Oxygen introduced in this case per rectum was next given, the quantity being a litre. The first application caused a painful burning sensation in the abdomen, accompanied by thin motions and vomiting. A considerable all-round improvement however had taken place by the next day, which continued for many days. The injections were now repeated at first weekly and later fortnightly, with the result that the patient made a complete recovery.

E. E. A.

TROPICAL DISEASES OF THE SKIN.

BRAULT (J.) & VIGUIER (A.). **Les champignons des teignes rencontrées à Alger.**—*Ann. de Dermat. et de Syph.* 1916. July. Vol. 6. No. 4. pp. 169–185. With 3 text figs.

This is a clinical and microscopical study of the fungi of the various forms of ringworm recently met with at the Mustapha Hospital in Algiers. The trichophytons observed have been: of the skin, *T. acuminatum,* 1 case ; of the scalp, *T. acuminatum,* 8 cases ; *T. violaceum,* 4 cases ; *T. crateriforme,* 2 cases ; *T. cerebreforme,* 1 case ; *T. granulatum,* 1 case ; *T. granulosum,* 1 case ; *T. luxurians,* 2 cases.

Several cases of Eczema marginatum, due to the fungus *Epidermophyton inguinale* were met with.

Only one case of a Microsporon tinea has been seen in 12 years and this was by one of the authors in 1906.

Favus does not seem to be so uncommon in Algiers. From December 1912 to May 1914, 22 cases were seen in the clinic. All but one case were due to *Achorion schoenleinii,* the one being caused by *A. quinckeanum.*

Several drawings of cultures and of fungi in cultivation illustrate the paper.

P. S. Abraham.

RICONO (M.). **Tinea bovina—Sitsua (Basuto) Mna (Kaffir).**—*S. African Med. Rec.* 1916. July 22. Vol. 14. No. 14. pp. 212–216. With 2 plates.

Tinea bovina, due to a fungus which may be called *Trichophyton bovinum,* which is similar to *Trichophyton equinum,* is fully described in this paper. It is very common in calves in South Africa, the disease showing in whitish patches especially about the head and neck ; and is frequently observed in the natives, especially those who have to do with cattle. The author has made numerous inoculations and cultural experiments.

In native adults the affection generally starts on the legs in a ring of desquamating epidermis, enlarging peripherally and developing pin head vesicles in the patch. The vesicle bursts, discharging fluid which dries into crusts over a raw surface.

In children glabrous and hairy parts may be affected simultaneously, and the scalp lesions may easily resemble pyogenic affections, especially the pyosis caffra described by the author. The lesion may also be mistaken for pustular syphilis, yaws, leprosy, pustular eczema, etc.

Sulphur and salicylic ointment is efficacious in early cases, chrysarobin in old chronic cases. It has a tendency to spontaneous cure after a time, especially in children.

The paper is well illustrated by photographs. P. S. A.

CHIEFFI (Alessandro). **La tigne nella provincia di Napoli.** [Ringworm in the Province of Naples.]—*Giorn. Ital. d. Malat. Ven. e d. Pelle.* 1916. July 26. Vol. 57. Year 51. No. 3. pp. 140–169.

An analysis of 83 cases of ringworm, and allied affections of the skin, observed during a period of 18 months, from April 1914 to October

1915, in the out-patient department of the Naples Clinic. The nomenclature employed is that of SABOURAUD. The distribution of the cases was as follows:—

I.

Trichophytosis of the beard	Macular type	Gypseum asteroides	3
		Rosaceum	1
	Depilatory type	Gypseum asteroides	7
		Rosaceum	8
		Acuminatum	1
		Violaceum	1
	Sycotic type	Gypseum asteroides	3
		Rosaceum	13
			37
Trichophytosis of the scalp	Depilatory type	Violaceum	15
		Gypseum asteroides	5
		Acuminatum	7
		Crateriforme	2
	Kerion	Gypseum asteroides	3
		Violaceum	1
			33
Trichophytosis of the non-hairy skin	Squamo-erythematous type	Gypseum asteroides	3
		Rosaceum	5
		Violaceum	2
	Pustulo-vesicular type	Umbilicatum	1
		Gypseum asteroides	1
		Acuminatum	1
			13

II.

Order of frequency of the type of parasite.

Trichophyton rosaceum	27
Gypseum asteroides	25
Trichophyton violaceum	19
,, acuminatum	9
,, crateriforme	2
,, umbilicatum	1
	83

It will be observed that in Naples ringworm of the scalp is uncommon, and is in fact less common than ringworm of the beard in its various forms.

Of ringworm due to *Achorion*, i.e., favus, the author observed during the same period 142 cases, of which 139 were on the scalp, and 2 on the body. One case due to Microsporon was also noticed. It was impossible in the latter to trace the channel of infection. Practically speaking, Microsporon ringworm is unknown in Naples.

Similar statistics as to the relative prevalence of different kinds of ringworm have already been compiled by other observers for the larger centres of Italy, from which it would appear that Naples is exceptional in the paucity of cases of ringworm of the head, and the frequency of ringworm of the beard. A bibliography of Italian memoirs bearing on the subject is appended.

J. B. Nias.

Radaeli (Francesco). **Formazioni pseudoactinomicotiche sperimentali da achorion Schönleini e da trichophyton violaceum.** [Experimentally produced Pseudo-Actinomycotic Forms of *Achorion Schönleinii* and *Trichophyton violaceum.*]—*Giorn. Ital. d. Med. Ven.* 1915. Nov. 26. Vol. 50. No. 5. pp. 413–418. With 1 plate.

The author injected into the aural and jugular veins of rabbits suspensions of agar-growths of *Achorion schönleinii*, obtained from a case of favus, and of *Trichophyton violaceum*, from a case of ringworm. The result was the production of infarcts in the lungs consisting of mycelial growths, which showed a strong resemblance to the radial formations of Actinomyces, as is shown in a plate.

The author insists, as a consequence, that a radial disposition of the hyphae of a mycelial growth in the tissues is not at all a certain proof that the organism in question is an Actinomyces. The tissues were hardened in alcohol, formalin, or Heidenhain's sublimate solution, while the sections were stained with a double stain of lithia- or alum-carmine, followed by Weigert's stain for fibrin. Sabrazès and Bukowsky have obtained similar results [see reference in text].

J. B. N.

Boucher (H.). **Un Cas de Blastomycose à la Côte d'Ivoire.**—*Bull. Soc. Path. Exot.* 1916. July. Vol. 9. No. 7. pp. 414–416.

A native woman, aged about 30, who had never had syphilis, with six healthy children, for two years had suffered with pains in the bones and irregular fever. There were several scars on the dorsal surface of the left hand and forearm following ulcerations which had been diagnosed as sporotrichosis and cured by potassium iodide. Subsequently a nodule developed on the right tibia larger than a pigeon's egg and recently the peroneal malleolus of the same leg became swollen and painful. Yellowish lesions were found on the soft palate and on the left inferior turbinal bone.

The tibial tumour was punctured and the sanguineous fluid obtained showed numerous rounded spores with double contour and above 10μ in diameter. The patient then disappeared and no cultural experiments could be made.

P. S. A.

ESCOMEL (E.). **A propos d'un cas de Blastomycose au Pérou.**—*Bull. Soc. Path. Exot.* 1916. Dec. Vol. 9. No. 10. pp. 756–759.

A case of blastomycosis in a mule driver working in an endemic district for this disease is here described. The ulcerated primary lesion had existed for 11 months (January 1915) on the right forearm before being seen by the author. The patient then complained of nothing in the nasal mucous membrane, but on examination a small round ulcer was seen in the right nostril and evidence of the disease further in, but nothing in the left. Both the ulcer on the arm and that in the nostril were removed by galvano cautery, and their bases deeply cauterised. Microscopical examination showed the characteristic three zones of a blastomycoma—a central parasitic, an intermediate and an external zone of blastomycosic cells (plasmocytes). In the initial lesion undergoing regression, there were large giant cells with 20 or 30 nuclei. Some of these cells contained blastomyces.

After removal of the initial lesion and the secondary nasal growth, three intravenous injections were given of antimony tartrate. The commencing ulceration on the turbinal horn was not modified, so this was cauterised. After a month all the lesions seemed to be cured.

The man returned to the endemic area in June 1916, and in July he presented himself with ulcerations in both nasal passages but no return in the forearm. A saturated solution of tartrated antimony was applied to the mucous lesions with some benefit.

The main points were the existence of giant cells, the three characteristic zones in the early secondary lesions, the blastomycosic cells easily demonstrated by Giemsa's stain, the importance of scraping at many points in order to show them, the fact that secondary lesions may develop after the primary has been cured, and that tartrated antimony does not give in blastomycosis such good and rapid results as we see in leishmaniasis.

P. S. A.

CASTELLANI (Aldo) & PINOY (E.). **Notes on a New Ulcerative Dermato-Mycosis.**—*Brit. Med. Jl.* 1916. Oct. 7. p. 486. With 1 plate.

Since 1907 Dr. Castellani has met in Ceylon peculiar ulcerative conditions due to a characteristic fungus, which has been named by Pinoy *Acdadium castellanii*. Cases have also occurred in the Malay States and in the Balkans.

As a rule, no hyphomycetic elements are seen in scrapings of the lesions, but cultivation in glucose agar shows small yellowish colonies in four to eight days. The disease has been successfully inoculated in coolies from pure recent cultures.

In a well marked case the ulcers may be situated all over the body and limbs and are sometimes purulent and crusted; nodules and furuncles may also be present. The lesions are not usually painful or itchy. The general health of the patient is not affected for a considerable time, but he may complain of weakness and general discomfort. The course of the disease is long, and if untreated there is little tendency to spontaneous cure. Most of the cases had been wrongly diagnosed as syphilis.

The affection is often readily cured by potassium iodide in 20 gr. doses three times a day, especially with a salt-free diet. Mercury and arsenic have no beneficial effect. Locally a weak mercury perchloride lotion is sufficient to clear the ulcers. Ointments are usually badly borne.

P. S. A.

WOLBACH (S. B.). **Recovery from Coccidioidal Granuloma.**—*Boston Med. & Surg. Jl.* 1915. Jan. 21. Vol. 172. No. 3. pp. 94-96.

This paper refers to the case culturally examined by Dr. Wolbach and successfully treated by curetting by Dr. W. P. BOLLES of Boston in 1914, the patient, now aged 75, having remained free from the disease ever since. The author emphasizes the fact that " coccidioidal granuloma " is a distinct disease, and should not be confounded with " true blastomycosis " (Torula infection), or " Cutaneous and systemic blastomycosis " so-called, in which the organism reproduces in tissues by budding and in cultures has a mould-like growth. In coccidioidal granuloma the organism grows in tissues by endogenous sporulation; in cultures as a mould-like fungus, never by budding.

In McNEAL and TAYLOR'S summary (1914) 24 cases were collected of coccidioidal granuloma including the case here referred to. This and one other in which a leg affected was amputated are the only ones that have recovered.

P. S. A.

TYAU (E. S.). **Human Sporotrichosis, with Report of Case.**—*China Med. Jl.* 1916. July. Vol. 30. No. 4. pp. 233–235.

The author records probably the first case of human sporotrichosis observed and microscopically diagnosed in China. The patient was a Chinese woman, aged 31, living near Amoy, affected for three years with sluggish inflamed swellings over the left elbow, which became nodular and subsequently broke down. Similar lesions appeared later near the right elbow. After prolonged search, smears from the discharge showed mycelia and spores of Sporotrichum. The purple red colour of the nodules and crateriform depressions were typical; there was neither pain nor itching, and the general health was unaffected.

External application of Lugol's solution, and increasing doses of potassium iodide soon produced marked improvement and recovery was complete in eight weeks.

P. S. A.

GREIG (David M.). **A Case of Sporotrichosis.**—*Edinburgh Med. Jl.* 1917. Jan. New Ser. Vol. 18. No. 1. pp. 42–46. With 1 plate.

An interesting and extensive case of sporotrichosis is here described. The patient aged 39, a native of Roseneath, went to sea when sixteen, had been employed in America where he had malaria, and subsequently migrated to South Africa in 1896 and was engaged in the mines. In 1910 he injured a finger with a piece of rock, and a swelling started in the axilla; this was variously treated by poulticing, lancing, scraping, vaccines, etc., but without permanent improvement; other abscesses formed and burst, and ulcerations set in in spite of surgical treatment in hospital, salvarsan, etc. He returned to Scotland in September 1912, and had the affected skin removed on the diagnosis of tubercle, but without stopping a further breaking down of tissue and recurrence of abscess formation. He came under the author's care in March 1913 with extensive ulceration on the right side of the chest reaching to the axilla (shown in a photograph). He was thin and anaemic and had lost now two stones in weight. A recently-developed patch over the sixth costal cartilage showed the characteristic appearances of the disease. The abscess was opened.

A dressing of 2 per cent. iodine in spirit was kept applied and potassium iodide commencing with 10 gr. doses, gradually increased to 25 gr., was given three times a day, until January 1914 when the lesion was quite cured and has so remained.

Repeated pathological examinations revealed no evidence of tubercle, cancer, actinomycosis, or streptothricosis and there was no syphilis. The true diagnosis was confirmed by Professor SUTHERLAND. The author remarks on the rarity of indigenous cases of this disease.

P. S. A.

MACFIE (J. W. Scott). **A Fourth Variety of Trichonocardiasis, with a Note on the Cultivation of** *Nocardia tenuis* **(Castellani, 1911).**—*Ann. Trop. Med. & Parasit.* 1916. Dec. 16. Vol. 10. No. 3. pp. 283–289. With 8 text figs.

Dr. Macfie in this paper gives an excellent account of "Trichonocardiasis"—an affection not uncommon in West Africa, but the occurrence of which in these parts has not been previously recorded, except by a brief reference by CHALMERS and O'FARRELL (1913). The disease, which affects the hair shafts in the axillae and groins, is caused by the fungus *Nocardia tenuis.* Three varieties are recognised: "Trichonocardiasis flava," T. nigra" associated with *Micrococcus nigrescens,* and "T. rubra" associated with *M. castellanii.* A fourth variety "T. fusca" is here added occurring in the Gold Coast, and distinguished by its brownish colour, instead of the yellow of "T. flava" or the rich red of "T. rubra."

Cultures gave yellow colonies of diplococci, resembling in general characters except in colour the cocci of the other varieties. The author has observed the other forms in West Africa, but not the black. Europeans are often affected by the disease, but as the natives usually shave the axillae it is difficult to say to what extent they are affected. It dies out in temperate climates, but is liable to reappear when a European returns to the coast.

Shaving alone is not sufficient to cure the disease, as it reappears on regrowth of the hair.

Scrapings from the infected hairs exhibited hyphae, some branching —which like the older growths in cultures were Gram positive; these are figured. The Gram reactions in young cultures were not uniform, or even negative. The fungus had not previously been cultivated, although CHALMERS and O'FARRELL observed some growth in hanging drops.

P. S. A.

i. Chalmers (Albert J.) & Archibald (R. G.). **A Sudanese Maduromycosis.**—*Ann. Trop. Med. & Parasit.* 1916. Sept. 30. Vol. 10. No. 2. pp. 169–222. With 4 plates.
ii. Chalmers (Albert J.) & Christopherson (J. B.). **A Sudanese Actinomycosis.**—*Ibid.* pp. 223–282. With 4 plates.

These two papers constitute most comprehensive monographs on the subject of the mycetomes, under which name the authors include "all growths and granulations producing enlargement, deformity and destruction in any part of the body of man, brought about by the invasion of the affected area by certain species of fungi belonging to different genera which give rise to variously coloured and shaped bodies called "grains," which are formed of hyphae with or without chlamydospores, and are found either embedded in the pathological tissue forming the growths and granulations, or escaping freely in the discharge from the diseased area." Following Pinoy, the diseases included under the general name "mycetome" may be divided into two distinct groups the "True mycetomes" and the "actinomycoses"—but the authors suggest the term "Maduromycoses" in place of the former. The first paper deals exclusively with the "Black maduromycoses" giving full historical, geographical and pathological accounts and detailing their own careful and numerous observations and experiments with material obtained from a case at Khartoum and from Semon's case from India.

The fungus cultivated from the Khartoum case and named by the authors "*Glenospora khartoumensis*" is nearly allied to, but not identical with that of Semon's Indian case.

ii. In the second paper the authors give a full historical and critical summary of our knowledge of the actinomycoses of man or "those forms of mycetoma with grains composed of very fine non-segmented mycelial filaments, in which usually the walls are not clearly defined from the contents, and without clamydospores." They believe that they have discovered a new form of actinomycosis in a man in the Sudan, due to a new fungus which they have named *Nocardia convoluta.* Elaborate details are given of their pathological and cultural observations.

As with "Maduromycosis" the best treatment is complete removal of the whole growth.

P. S. A.

Medina Jiménez (R.). i. **Segunda nota sobre afecciones micósicas.** [Second Note on Mycotic Affections.]—*Gaceta Med. de Caracas.* 1916. Apr. 15. Vol. 23. No. 7. pp. 49–51. With 3 plates.
ii. **Tercera nota sobre afecciones micósicas.** [Third Note on Mycotic Affections.]—*Ibid.* Apr. 30. No. 8. pp. 57–58. With 1 plate.
iii. **Afecciones micósicas de Venezuela.**—26 pp. With 5 plates. 1916. Caracas. Tipografia Guttenberg.

In a previous note [see this *Bulletin,* Vol. 6, p. 136] the author described certain varieties of skin disease occurring in Venezuela, as new. One of these, there identified with Khi-Huen, now turns out to be Caraté attacking the wrists and ankles [note ii]; while the other [note iii], locally known as "galapago," proves to be actinomyocosis.

iii includes the substance of i and ii.

J. B. N.

McNair (James B.). i. **The Pathology of Dermatitis Venenata from** *Rhus diversiloba.*—*Jl. Infect. Dis.* 1916. Sept. Vol. 19. No. 3. pp. 418–428. With 7 text figs.

ii. **The Transmission of Rhus Poison from Plant to Person.**—*Ibid.* pp. 429–432.

i. The poisonous sap of " Poison Oak," *Rhus diversiloba,* may enter the skin through the gland ducts, the hair follicles or through the surface itself, and produce inflammation of varying degree of intensity. The effects are observed at all times of the year, but at Berkeley in California they are mostly seen in February, March and April.

The author has made an elaborate pathological investigation and has shown that leucocytosis is a prominent result of the absorption of the poison, especially in the severer cases. Sections of the affected skin always showed leucocytes, with predominating mononuclear cells.

He gives a summary of his observations :—

" The sap of poison oak (*Rhus diversiloba* T. & G.) contains a slowly diffusible skin irritant.

" This irritant makes entrance through the sudoriparous and sebaceous ducts, the hair follicles, and through the skin itself.

" It produces a dermatitis in many ways similar to many other forms of dermatitis venenata.

" Slight constitutional disturbances may take place ; a temperature of 37·5 C. ; sometimes a febrile condition involving a coated tongue, loss of appetite, and constipation. The urine may have a trace of albumin. One case of acute nephritis is recorded. Sugar has never been noticed.

" The seat of inflammation involves that part of the integument which comes in contact with the poison. In over 1,000 cases the backs of the hands, the inside of the forearms, the eyes, ears, and genitalia have been thus involved. The vesicular exudate is non-toxic.

" The course of the affection is often acute. It usually reaches its maximum within several days after exposure and may subside within from four to six days.

" Diagnosis may occasionally be difficult. History of the onset, occupation, and exposure is useful. Peculiarities may be noticed in the distribution and configuration of the eruption in distinction from eczema and herpes."

ii. In the second paper the author gives details of a large number of experiments carried out to determine the nature of the poison and whether it be gaseous or not. He has demonstrated that the poison of *Rhus diversiloba* is non-volatile, even when mixed with volatile oil, but that it may be carried by the particles of soot in smoke ; that the pollen of the plant is non-toxic ; that neither the plant trichomes nor their exudate is poisonous ; and that it is the resinous sap only that is toxic.

His conclusions are that :—

" The poison of *Rhus diversiloba* is not carried normally by the wind, for it is neither bacterial nor volatile, and the pollen, the plant hairs, and the cork cells are nontoxic.

" Poisoning may occur as the result of direct contact with the unfiltered smoke from the plant, direct contact with the resinous sap, or indirect contact with the resinous sap on clothing, cord wood, tools, etc."

P. S. A.

HAYS (Melville A.). The Treatment of Ivy Poisoning.—*New York Med. Jl.* 1916. Nov. 4. Vol. 104. No. 19. Whole No. 1979. pp. 902–904.

In this paper the experiences of several medical men are given in the treatment of Dermatitis venenata due to contact with "poison ivy" or plants of the genus Rhus.

Dr. Hays, of New York, particularly recommends free sponging and dressing with saturated solution of sodium bicarbonate. Dr. ACHARD of Chicago, uses lotions containing magnesium carbonate, and refers to Dr. TRENCH's method of chewing the leaves of the plant and swallowing the juice as a prophylactic as well as curative measure.

Others use soap suds followed by alcohol, lead and opium solution to allay the burning and pain, weak carbolic solution, boric acid solution, calamine lotion, and cream with copper sulphate 5 gr. to the ounce.

P. S. A.

FROST (Lowell C.). The Bacterial Etiology of Poison-Oak Dermatitis (Rhus Poisoning).—*Med. Record.* 1916. Dec. 23. Vol. 90. No. 26. Whole No. 2407. pp. 1121–1123.

The author reports, from a large number in his experience, seven cases of dermatitis due to *Rhus diversiloba* or "poison oak," which with laboratory experiments on certain bacteria found on the leaves of the plant lead him to believe that the dermatitis is an exanthem caused by invasion of a definite organism and not, as generally thought, by the cutaneous irritation of a chemical poison or toxic oil secreted by the leaves. He admits that this oil is irritating to the skin, but considers that its toxicity is exaggerated and that the dermatitis is otherwise caused for the following reasons:—(1) There is an incubation period, averaging 4½ days, the time being influenced by the dose. (2) Complete immunity is shown by certain individuals. (3) This immunity may be diminished through a lowering of the physical condition, change of climate, etc. (4) Exposure may be strictly limited to proximity to the plant, without contact. (5) The first appearance of the exanthem is often on an area untouched by the plant or protected from subsequent indirect contagion. All these considerations and others point rather to a bacillary origin of the affection than to its being the effect of an irritant poison.

Bacterial cultures made in August 1915 from the leaves of *Rhus toxicodendron* showed several types of cocci and bacilli; one short thick bacillus, about 3 to 4 microns long and 2 broad, was apparently constant on all the leaves examined, especially on the under surface. Growth was abundant on potato, but not on agar, gelatine or bouillon. Inoculation of the pure culture in the skin produced slight redness after 48 hours, but without further symptoms. The author has been unable to carry out further experiments but he thinks that important results on these lines may be attained by competent investigators.

P. S. A.

CHALMERS (A. J.) & MARTIN (A. F. C.). **Acnitis in an Egyptian Soldier.**—*Proc. Roy. Soc. Med.* 1916. Nov. Vol. 10. No. 1. Sect. of Dermat. pp. 23-50. With 17 text figs.

This paper gives an exceptionally full and well illustrated account—clinical and pathological—of a case of acnitis, the first recognised in Africa.

In June 1916, an Egyptian soldier, aged 27, suddenly developed an eruption on the face, with slight fever. When seen five days later there were numerous discrete papules especially on the forehead, nose, cheeks and chin, the ears, sides and back of the neck, where they were closely packed, and on the backs of the hands, the distribution being limited to parts exposed to light.

The patient was at once treated by intestinal disinfection, small doses of calomel every night with salines, and salol in the day, the eruption disappearing in a few days. The treatment was then stopped, but in about a week the papules reappeared, although not so extensively, on the face and neck, some of the lesions now containing pus. This second eruption quickly disappeared on resuming the treatment. No tubercle bacilli could be detected in the lesions nor in the man's sputum and inoculation in a guinea-pig was negative, but von Pirquet's reaction was strongly positive.

An elaborate description with microphotographs is given of the histological changes found by the authors and by other observers and the etiology is fully discussed as well as the differential diagnosis of the affection from acne vulgaris, acne varioliformis, lupus vulgaris and other tuberculides, erythema induratum, dermatitis nodosa rubra and drug eruptions.

The authors regard acnitis " as an eruption caused by a poison generated under the influence of sunlight by cutaneous cells sensitised to the tubercular virus, and attacked by the products of an intestinal autointoxication, the whole process being *anaphylactic* in nature." They recommend at an early stage treatment against the autointoxication.

P. S. A.

BALLIANO (A.). **Osservazioni sopra l'ulcera rotonda fagédenica tropicale.** [Observations on Phagedænic Tropical Ulcer.]—*Morgagni.* 1916. June 30. Vol. 58. Pt. 1. No. 6. pp. 205-217. With 1 plate.

An account of the author's experience with tropical ulcer occurring in Libyan native soldiers. The patients themselves attribute the occurrence of these ulcers to cuts and abrasions of the feet and legs received during military manoeuvres on stony ground. The legs of the native being seldom clean, infection of these wounds occurs with the *B. fusiformis* and its associated spirillum. The author apparently succeeded in isolating this organism in all his cases. A number of treatments for these ulcers were tried, but all were perfectly unsuccessful with the exception of iodoform which, dusted on the wound for two or three days, speedily leads to a perfect cure. Brief details are given at the end of the paper of 24 cases, in which this treatment was employed.

Having convinced himself of the perfect efficacy of the iodoform treatment, the author ventured upon auto-inoculation of such ulcers, experimentally. Scarifications were made on the forearm, or the inner side of the thigh, into which pus from an ulcer was rubbed. The seat of inoculation was then covered with a watch-glass strapped on with plaster. After 10–12 hours a slight reddening and swelling of the edge of the scarified area was observed, followed at the end of 24–36 hours by a yellow pimple under the skin. By the third day a pustule is formed, conical and surrounded by a red halo, of the size of a one-centime piece. If the epidermis of such a pustule is removed, a characteristic round ulcer is found underneath, cup-shaped and with all the characters of the original sore. By the seventh day the sore is as large as a 2-lira piece, and the pus has the characteristic foetor. In this pus the fusiform bacillus will be found in profusion, but the spirilla are seldom present, being only found twice in 26 inoculations, and then only in small numbers. The experimental ulcer heals as readily under iodoform treatment as the natural one. A bibliography of 68 papers bearing on the subject of tropical ulcer is appended. [M. BLANCHARD (1914) appears to have been the first to transmit tropical ulcer by contagion from man to man. For an account of his experiments see this *Bulletin*, Vol. 4, p. 36.]

J. B. N.

BOUCHER (H.). **Traitement rapide de l'ulcère phagédénique des pays chauds.**—*Bull. Soc. Path. Exot.* 1916. July. Vol. 9. No. 7. pp. 419–425.

The author describes 14 cases of phagedenic ulceration, rapidly cured by the application of "formol" (40 per cent. formaline) on a cotton wool tampon. In most cases one application has been sufficient, followed, when a scab has formed, by a bismuth dressing. In only two cases have three applications of formol been necessary.

Formol has also been in his hands the best treatment for guinea-worm, the tumour being opened and cotton soaked in formol inserted; the worm can then be rotated out on a stick without rupture.

The author further strongly recommends python fat as a basis for ointments.

P. S. A.

LOW (G. C.) & NEWHAM (H. B.). **A Case of Ulcerating Granuloma successfully treated by Intravenous Injections of Antimony.**—*Brit. Med. Jl.* 1916. Sept. 16. pp. 387–389.

After giving an excellent description of the disease, and a resumé of observations on the use of antimony in tropical medicine, and especially in ulcerating granuloma, the authors record the case of a man who had lived in the Gold Coast, with the usual leaves home, since 1908.

At the beginning of this year, a small sore appeared on the glans penis two days after connection with a black woman. Three injections of salvarsan and 13 of mercury had no effect in stopping the ulceration and Wassermann's reaction was negative.

The case was admitted by Mr. CANTIEL in the Albert Docks Hospital and intravenous injections of antimonium tartaratum commencing with 1 gr. in 2 oz. of normal saline was given from May 1st. The third and fourth injections contained 1½ gr., the fifth and sixth 2 gr., and from May 22nd—the seventh injection—2½ gr. This amount was continued every two or three days until 30 injections had been given.

Distinct improvement was very soon observed and complete healing was effected after 53½ gr. had been given.

The authors have thus proved that treatment by antimony alone may succeed in healing this intractable disease, but they suggest that a judicious combination of X rays and antimony injections might shorten the treatment.

P. S. A.

JOHNSON (L. W.). **A Case of Gangosa.**—*U. S. Nav. Med. Bull.* 1916. Oct. Vol. 10. No. 4. p. 667.

Treatment by salvarsan and mercury has been so successful for gangosa at Guam that active cases are now rare. Three cases after a long interval have been recently treated in the hospital, and one is here described. A girl, aged 14, had yaws when two years old. Seven months before admission a small sore appeared on the end of her nose, spreading into a large crusted ulcer involving the upper lip, cheek, and nose, the tissues around being swollen and dusky red. Most of the nasal septum was destroyed, but there was no involvement of the hard palate or oral mucous membrane. There was discomfort due to the foul odour and obstruction of the nostrils by crusts, but no pain.

A Wassermann reaction was strongly positive. Salvarsan ·3 gm. was given intravenously, producing a strong reaction, with congestion and bleeding from the surface. There was a remarkable change in 24 hours. Mercury was subsequently given by inunction and iodides by the mouth ; a rapid cure resulted and she was discharged in 25 days. Photographs taken before treatment, 48 hours after the salvarsan, and just before she left the hospital illustrate the paper.

P. S. A.

ROSS (Philip H.) **Dermatitis due to the Secretion of a Beetle in British East Africa.**—*Jl. Trop. Med.. & Hyg.* 1916. Sept. 1. Vol. 19. No. 17. p. 202.

In July and August 1915 several cases of acute dermatitis occurred in Nairobi, caused by a small beetle of the genus *Paederus*, and similar to the epidemic described by RODHAIN and HOUSSIAU at Leopoldville, which was due to another species of the same genus [see this *Bulletin*, Vol. 7, p. 132, where the name of the genus is wrongly given]. The East African beetle is slightly larger than the latter. It appears that the beetle only exudes the acrid fluid when irritated, and the lesions are vesicular,. and may be either in patches or lines, and are painful like a burn. The beetles are especially to be seen in July and August.

P. S. A.

QUIROS (David). **Biologia de la Nigua.** [Biology of the Chigger.]—*Anales del Hosp. de San José.* 1916. Nov. 1. Vol 2. No. 1. pp. 1–17. With 4 figs.

A well-written account, in parallel columns of Spanish and Italian of the biology of the chigger or sand-flea (*Dermatophilus penetrans*).

In Costa Rica its principal host is the domestic pig, whose feet are often severely invaded, as is well shown in a figure. As these animals are driven through the towns to the markets or slaughter-house, they infect the soil of the streets, and secondarily human beings. The sores created by the chigger are, so the author says, often the portal of entrance of the tetanus bacillus, the most frequent victims being the bare-footed boys, from 4 to 14 years of age, who play in the streets, while men, women and girls are affected in a lesser proportion. From statistics furnished by public authorities, it would appear that, in the last four years, the number of deaths from tetanus in Costa Rica amounted to no less than 1,147. Making an allowance of 75 per cent. in this number for wrong diagnosis and other modes of infection, the author reckons 250 deaths from tetanus, during the preceding four years, as being due to chiggers. The total population of Costa Rica is 370,000 persons. In the neighbouring Republic of Nicaragua, the chigger is regarded as equally dangerous. Another lesion, which may be thus caused, is gas-gangrene. The author knows personally of two cases, one in an Italian and the other in a Frenchman, in which death was thus caused through chiggers.

When the insects are few, they can be dug out of the skin in the usual way, with a needle, but when they are numerous this method is too tedious and too painful for adoption. A good application is then found in the following ointment.

Salicylic acid	2·50 gm.
Icthyol	10 „
Yellow vaseline	10 „

In a few days after its application the scabs will fall off and the skin is then left clean. Local baths of petroleum to the affected parts are also good. Tincture of iodine, often recommended, the author does not like. The burrows remaining after the extraction of the insect should always be dressed antiseptically, say with a warm fomentation of 1 : 1,000 sublimate solution. The laity fill the burrows with wax from the ear, chewed tobacco, or cigar-ash.

The best prophylaxis against chiggers would be a prohibition against bringing pigs affected with chiggers to the public slaughter-house through the streets, along with regulations for treating affected pigs in the localities where they are kept.

J. B. N.

SERGENT (Etienne) & ALARY (A.). **Petite épidémie d'acariose en Algérie.**—*Bull. Soc. Path. Exot.* 1916. Dec. Vol. 9. No. 10. pp. 771–773.

Irritation produced by the "acarien" of barley—*Pediculoides ventricosus*—may become intolerable and produce an affection simulating urticaria and scabies—sometimes like a small epidemic, as in the autumn of 1916 in the valley of Chéliff. The eruption generally begins on the limbs, the face or neck, and spreads over the body, particularly the thorax. Pimples sometimes cover the whole body or the lesions may be like urticaria, but with a small vesicle in the centre of the patches. Swelling of the face and neck may ensue, and after some days the patches subside, but the itching may continue and lesions from scratching appear.

The site of the eruption differs from that in scabies, but as in that affection the pruritus is made worse by heat and at night.

The symptoms may come on very rapidly—in a few hours—after being in contact with a person affected or after handling barley.

Left to itself the affection usually disappears in about 12 days, but in children, especially, itching and scratching may long continue. Antiseptic lotions ameliorate the pruritus, and cases have been quickly cured with sulphur and with Helmerich's ointment.

P. S. A.

CONNOR (Roland C.). **A Case of Scleroderma.**—*Proc. Med. Assoc. Isthmian Canal Zone.* Apr. to Dec. 1915. Vol. 8. Pts. 1 & 2. pp. 59–60.

The author reports a case of diffuse symmetrical scleroderma in a woman aged 24, a native of Bogota, Colombia. The induration of the skin was of above a year's duration, commencing on the neck and extending down the arms, and later appearing on the face, chest, back and legs. The hidebound condition was practically everywhere, except over the abdomen and on the legs below the knees. Under treatment for two months with thyroid extract and inunction with cocoa butter some improvement was observed.

P. S. A.

d'ANFREVILLE (L.). **La Kératodermie symétrique en Afrique.**—*Bull. Soc. Path. Exot.* 1916. July. Vol. 9. No. 7. pp. 442–444. With 1 plate.

The author has found this affection more frequent in Morocco than in Senegal, and records several cases at Rabat and at Salé. He does not agree that they are syphilitic in origin, but thinks that the symmetrical hypertrophic lesions on the soles and palms occurring chiefly among the poorer class are due to the wearing of sandals in the cold and damp weather of winter. An appended photograph shows the lesions of the feet and hands in a girl of 12.

P. S. A.

URBAIN (Gaston). **Un cas de gale démodectique du cheval. Contagion à l'homme.**—*Bull. Soc. Path. Exot.* 1916. Oct. Vol. 9. No. 8. pp. 576–578.

The author describes his observations on parasites found in the fowl, the dog and the horse in Brazil. He is led to believe that the demodectic itch of the horse is contagious to man in consequence of the following case. A horse was extensively affected. A young man had attended the animal for a year, and although his face was free from comedones until he had to do with the horse, they gradually developed on the forehead and cheeks. Microscopical examination showed that the same demodex existed in scrapings taken from the skin of the horse and in the comedones removed from the man's face.

P. S. A.

POLLARD (J. Mc. F.) & JOHNSTON (J. E. L.). **Chinese Toe-Rot and Foot-Tetter.** [Correspondence].—*Lancet.* 1916. Aug. 19. p. 343.

The authors refer to a note on " Chinese Toe-rot " in the *Lancet* of June 10th, 1916,* and observe that a similar condition is fairly common in Nigeria. They have found that the most effective treatment is an antiseptic ointment rendered alkaline, e.g., Ung. hyd. nit. dil. with addition of 5 grains of soda bicarbonate to the ounce. They believe that the causative organisms only flourish in an acid medium. Cases which have withstood for years sulphur and iodine, and various antiseptic dusting powders have rapidly yielded to treatment on these lines.

P. S. A.

de CAMPOS (Murillo). **Sobre algumas affecções cutaneas do interior do Brasil.** [Some Skin Affections of the Interior of Brazil.]—*Arch. Brasileiros de Med.* 1915. Oct. Vol. 5. No. 10. pp. 358–363.

Brief notes of certain skin diseases observed by the author in the course of a journey into the interior of Brazil in the years 1910 and 1911, mostly in Indians.

1. Guinea-worm was found to be common and, from unskilled attempts at extraction of the worm or neglect to do so, abscesses in various parts of the body with secondary inoculation of the pus by scratching frequently result. Notes are given in detail of four cases in which the consequent state of the affected individual became serious.

2. Certain pustular affections were also noted which were due to the bites of the " pium," a species of *Simulium*, and the " gunpowder mosquito," a species of *Ceratopogon*. The case is especially mentioned of a white youth who had stripped himself to the waist, while rubber-tapping, on account of the heat, with the result that the whole of the exposed surface of the body became covered by an eruption of vesicles and papules, due to the bites of these insects, which was intensified by the consequent scratching until distinct fever and general impairment of the health resulted. The patient was taken into a hospital under the belief that he was suffering from an attack of small-pox. There is a second species of *Simulium*, known as the " borrachudo," which causes similar symptoms. The author publishes his notes with a view to calling further attention to the subject.

J. B. N.

RICONO (M.). **Cases of Fibroma Molluscum and Cheloid.**—*S. African Med. Rec.* 1916. Aug. 12. Vol. 14. No. 15. pp. 228–231. With 1 plate.

The author describes and figures a case of generalised molluscum fibroma in a Basuto woman, aged 60, which illustrates the family tendency to the condition, the mother and a sister being affected with multiple fibromata of the skin. In this case they began to appear at puberty.

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* " Chinese Toe-Rot " [*Lancet*, June 10th, 1916, p. 1,200]. A case described by a correspondent (R. G.) under this name was probably an example of the condition described by CANTLIE in "Foot-tetter" in which he found a diplococcus easily cultivated. The skin between the toes becomes hypertrophied, peeling and leaving a tender, raw and itching surface. The soles and sides of the feet may become involved, and the condition may spread elsewhere. It is very persistent and in addition to local treatment with sulphur and boric powder the shoes must be kept disinfected.

Two cases of cheloid are also described and figured. The one a Mosuto man aged 35 was the nephew of a chief who had a cheloid on the sternum. At least fifteen of the chief's sons and nephews had developed cheloids on various parts of the body.

The other case a Mosuto woman, with a large cheloid on the sternum and others on the face following tattoo marks.

Removal of cheloids from the lobe of the ear was successful in two cases. Fibrolysin had no effect.

P. S. A.

HEIM (Gustav). **Seltenheit des Lupus und der Psoriasis in heissen Ländern.** [Infrequency of Lupus and Psoriasis in Hot Climates.] —*Dermatol. Zeitschr.* 1916. June. Vol. 23. No. 6. pp. 357–365.

The gist of this wordy paper is that lupus vulgaris and psoriasis are rarely seen in hot climates. This was the experience of several German medical men who practised for many years in Egypt and other warm countries, and was confirmed by the author in his three years' work in South-West Africa.

He suggests that patients of means and fond of travel might seek a cure for these diseases by heliotherapy in such sunny lands.

P. S. A.

Reprints and Pamphlets received:—

FRIEL (A. R.). Piantication and Anapiantication.—*South African Institute for Medical Research,* 1915.

LISTER (F. S.). An Experimental Study of Prophylactic Inoculation against Pneumococcal Infection in the Rabbit and in Man.—*South African Institute for Medical Research,* Memoir No. 8, 1916.

LISTER (F. S.). Specific Serological Reactions with Pneumococci from Different Sources.—*South African Institute for Medical Research,* 1913.

LOW (G. C.). The History of the Use of Intravenous Injections of Tartar Emetic (Antimonium Tartaratum) in Tropical Medicine.—*Trans. Soc. Trop. Med. & Hyg.,* 1916.

McCRAE (J.). The Ash of Silicotic Lungs.—*South African Institute for Medical Research,* 1913.

da MATTA (A. A.). Diagnostico differencial del granuloma ulceroso y su tratamiento por el emetico.—*Gaceta Med. Caracas,* 1916.

da MATTA (A. A.). Yodoterapia y salicilo-yodoterapia endovenosa.—*Acad. Nac. Med. de Caracas.*

da MATTA (A. A.). Parasitos intestinaes na populacao infantil do Amazonas.—*Arch. Brazil Med.,* 1914.

da MATTA (A. A.). 1. Os nematoides do tubo digestivo de que modo infestam o organism? Prophylaxia. 2 Nematoides prejudiciaes ao homen. Sua classificacao clinica —*Brazil Med.,* 1915 and 1916.

MAYNARD (G. D.). An Enquiry into the Etiology, Manifestations and Prevention of Pneumonia amongst Natives on the Rand, recruited from Tropical Areas.—*South African Institute for Medical Research,* Memoir No. 1, 1913.

MAYNARD (G. D.). The Trypanosomes of Sleeping Sickness being a Study of the Grounds for the Alleged Identity of *T. brucei* with those causing Disease in Man in Nyasaland.—*South African Institute for Medical Research,* Memoir No. 6, 1915.

MAYNARD (G. D.) & TURNER (G. A.). Anthropological Notes on Bantu Natives from Portuguese East Africa.—*South African Institute for Medical Research,* 1914.

de SOUZA ARAUJO (H. C.). A prophylaxia da Lepra no Paraná (Nota preliminar).—*Jl. do Commercio.,* 1916.

WATKINS-PITCHFORD (W.) & MOIR (J.). On the Nature of the Doubly-Refracting Particles seen in Microscopic Sections of Silicotic Lungs, and an Improved Method for disclosing Siliceous Particles in Such Sections.—*South African Institute for Medical Research,* Memoir No. 7, 1916.

Note.—On direct application (not through agents or booksellers) any of the foregoing reprints or pamphlets will be sent on loan to any part of the world, the Bureau paying outward postage.

Book received.

de SOUZA ARAUJO (H. C.). [Dr.] Granuloma Venéreo. Trabalho do Instituto Oswaldo Cruz.—246 pp. With 40 text-figs. and 7 plates, 1917. Rio de Janeiro: Companhia Lithographica, Ferreira Pinto.

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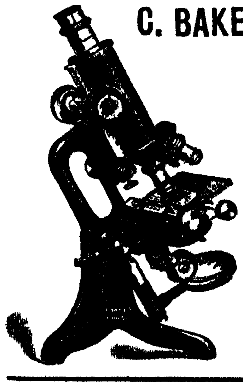

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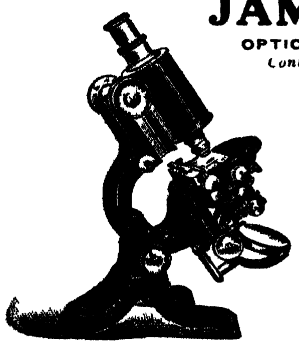

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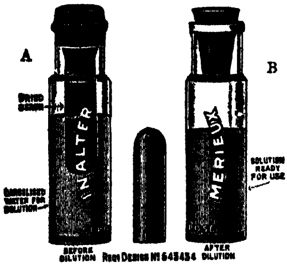

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TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 9.] 1917. [No. 5.

LEPROSY.

JEANSELME (E.). **Note sur la fréquence de la lèpre parmi les recrues coloniales.**—*Bull. Soc. Path. Exot.* 1916. Nov. Vol. 9. No. 9. pp. 685–687.

Since the beginning of the war, M. Jeanselme has had occasion to invalid out of the army three leprous soldiers with obvious symptoms, who had passed before several medical commissions without the nature of the disease being suspected. The condition in two of them had been diagnosed as " tuberculo-ulcerous syphilides " and in the third as polyneuritis.

These errors of diagnosis seem to be not rare. Another case of well developed leprosy with a leonine face had been many months in the campaign before the disease was recognised. If these well marked cases are overlooked, it is probable that many with commencing or slight lesions are also missed.

In every case of a native or of a white man who has lived in the colonies who presents cutaneous nodules, or erythematous or pigmented spots of uncertain nature, search should be made for changes of sensation in the area and neighbourhood of the lesions, anaesthesia, thermo-analgesia or muscular atrophies, especially of the interosseous muscles of the hands, thenar and hypothenar eminences, diminution of power of muscular contraction, thickenings of the ulnar nerve, and the presence of acid-fast bacilli in nasal scrapings and in the nodules. M. Jeanselme describes methods for carrying out these investigations.

P. S. Abraham.

REMLINGER (P.). **Note sur l'état de la lèpre au Maroc.**—*Bull. Soc. Path. Exot.* 1916. Oct. Vol. 9. No. 8. pp. 563–567.

According to the author leprosy is probably as prevalent in Morocco as it is in Algeria. There is a " leproserie " at Marrakech with 20 to 30 lepers and a well known endemic centre of the disease at Haouz. It is also endemic in the valley of Oued Souss, and among certain tribes near Mogador. The lepers who have come to consult Dr. CAMPREDON at Mogador have all been affected with nodular or mixed leprosy, have been males and with one exception have been Berber Mussulmans. At Doukkala in the hinterland of Mazagan, a village of lepers existed until 1893, when they were dispersed by the Sultan. Several cases of leprosy have been observed in other parts of the country, and since 1911 the author has met with five cases at Tangiers, three men and two women, probably imported cases, one Portuguese born in Andalusia, and four Israelites who had been in Brazil.

It is impossible to give an estimate of the number of cases in the whole country, much of which is unexplored by medical men. Special points to be noticed are, that the disease exists equally on the coasts as in the interior, that it is practically confined to the Mussulman, and the rarity of evidence of contagion in spite of the absence of hygienic or other precautions. At present severe measures of prophylaxis do not seem to be necessary.

P. S. A.

THÉZÉ (J.). **Pathologie de la Guyane française. (Lèpre, Filariose, etc.). Rapport sur les Travaux de l'Institut d'Hygiène et de Bactériologie 1914-1915.**—*Bull. Soc. Path. Exot.* 1916. July. Vol. 9. No. 7. pp. 449–469. [V. La Lèpre. pp. 449–464.]

In 1685 an attempt was made by edict ("Code noir") to prevent leprous slaves from entering Guiana; the author believes that if this had been effectively carried out the colony would have been free from the disease, which according to ULLOA (Brazil) and PINSON (Peru) did not exist in the New World until the introduction of the African slaves. Leprosy spread in the Colony, and in 1777 a "leproserie" was established at l'Ilet la Mère, and owners were ordered to notify their leprous slaves. In 1802, 30 lepers were in isolation in the island. The law was then in abeyance during the Portuguese occupation until 1817 when the French resumed possession of the colony. From that time many laws were passed in reference to the lepers, and in 1848 the isolation law was reinacted; but in place of the obligatory declaration on the part of slave owners, medical men (not specialists) were required to search for the lepers who were brought before a Board. Various modifications of the statute then took place, but with little or no success, up to 1891 and 1892. According to these later laws, all lepers who wish to go and all who have no means of caring for themselves, vagrants, beggars, etc., are sent to the leper settlement of Acarouany, while others of easy circumstances may remain at home under proper hygienic conditions not nearer than 2 kilometers from Cayenne, or 1 kilometer from other towns.

The relaxation of the laws has not resulted in diminishing the disease. To estimate the actual number of lepers in the colony is very difficult. Various figures have been given, some quite fantastic. The last Government enumeration (1915) gave a total of 81, but this number is obviously under the mark. The author estimates the number in Cayenne alone at approximately 83, and he believes that there must be about 300 in the whole colony, without counting those at present in the leper settlements.

The great proportion of macular cases, *i.e.*, of early leprosy, is in the author's opinion, a proof that the disease is on the increase, and he considers that the young lepers constitute a great menace for the future. Most of these cases are children, who do not come under notice or under treatment, or are hidden until the symptoms become very obvious, *e.g.*, on the face (" mal rouge de Cayenne "). The public belief is that the disease is " in the blood," or hereditary. Nearly all the cases are of the poorer classes. The aboriginal Indians alone seem to be immune from the disease.

There are now two leproseries, one for the civil population at Acarouany, the other for prisoners at the Isle of St. Louis. The former is on the borders of a creek 35 kilometers by river from Mana, isolated and difficult to get at, most miserable and insanitary in every way, and generally condemned. Only outcast or abandoned lepers are sent there; in 1914 they numbered 42. The penal lepers at the Isle of St. Louis are better off; they are generally about 60 in number.

At present the prophylactic measures against leprosy in Guiana are deficient. The author discusses the difficulties of carrying them out and recommends a systematic expert examination of every child for spots, particularly on the buttocks, back and thighs—the most frequent sites—in order to discover the early cases and to keep them under medical supervision. He does not believe in the possibility of efficacious home isolation in the class affected in Guiana but, believing in the contagiousness of the disease, he recommends collective internment, preferably in regional leproseries where the patients could be isolated not far from their friends, and be in happier circumstances than in one large establishment.

P. S. A.

Rivas (D.). **The Bilateral Distribution of the Lesions in Leprosy in Relation to the Bacteremic Nature of the Disease.**—*New Orleans Med. & Surg. Jl.* 1916. Sept. Vol. 69. No. 3. pp. 215–218.

The author refers to his previous observations demonstrating the presence of the *Bacillus leprae* and of *lepra cells* in the circulating blood of lepers as a constant rather than accidental occurrence [see this *Bulletin*, Vol. 5, p. 329], and he considers that the " bacteremic " nature of the disease is further proved by the remarkable bilateral symmetry of the lesions in leprosy. He discusses the terms " bacteremia " and " bacteremic disease " and defines the latter to be a disease or affection " in which the pathogenic bacterium, the cause of the infection, lives, grows and multiplies in the circulating blood of the patient during the course of the disease." All cases of bacteremic infections, when accompanied with skin eruptions, have these eruptions bilaterally distributed or generalised, the virus living in the circulating blood being distributed more or less equally throughout the body. He considers that this is clearly demonstrated in leprosy.

P. S. A.

Honeij (James A.). **Bone Changes in Leprosy. (An Abstract).**—*New Orleans Med. & Surg. Jl.* 1916. Sept. Vol. 69. No. 3. pp. 219–222. With 4 text figs.

The earliest changes observed by the author have been either thinning of the epiphyses, especially the distal ends, or a decrease in circumference of the distal phalanges of the little finger. The changes may range from early atrophy to total absorption, inflammatory action, distortion or fracture. It appears that the thumb bones are rarely affected. In the nerve type of leprosy atrophic changes may be expected, and in the nodular cases inflammatory or hypertrophic changes. As a matter of fact, this may be reversed, and both kinds of change may be observed in the one form.

The author suggests that the bone changes in leprosy are due to factors of metabolism rather than to the direct action of the bacilli.

The paper is illustrated by a number of skiagrams.

P. S. A.

AIYAR (T. A. R.). **The Etiology of Leprosy.**—*Brit. Med. Jl.* 1916. Dec. 16. p. 837.

This note adds little or nothing to our knowledge. The writer is well acquainted with 12 instances in his practice, and he maintains that there was ample evidence to prove that the malady was not contagious. They were not isolated and no members of their families had been infected in 20 years. He thinks that there is "evidence to show that a leprotic father can transmit the disease to the offspring without infecting the mother" and admits that how leprosy actually spreads needs further investigation.

P. S. A.

ROSENTHAL (Melvin S.). **Lepra mutilans.**—*Jl. Amer. Med. Assoc.* 1916. Oct. 28. Vol. 67. No. 18. pp. 1292–1293. With 3 text-figs.

This is an interesting account of a coloured bootblack, aged 22, born in Demerara and living in Barbados from 1897 to 1907, in which year he came to New York and worked as a labourer. In 1908 he noticed contraction of the fingers with anaesthesia and with subsequent loss and deformity of fingers and toes, and development of thickenings, nodules and ulcerations on the face, ears, etc. On presenting himself at the Mercy Hospital in April 1916, he was obviously a well-marked case of advanced mixed leprosy, the diagnosis of which had been hitherto overlooked. As the author remarks: "It is difficult to conceive that a man with so pronounced and evidently serious a skin disease should have entirely escaped a diagnosis in spite of the fact that within a year he had been treated both as an ambulatory and a bed case in several hospitals." In the author's opinion "this case well illustrates the urgent need of a national leprosarium where these unfortunates can find a permanent refuge, and the community be spared the presence of an unsightly, mutilated and incurable human being awaiting the final call."

P. S. A.

LANE (John E.). **A Case of Leprosy in Connecticut.**—*New York Med. Jl.* 1916. Dec. 23. Vol. 104. No. 26. Whole No. 1986. p. 1244.

As far as the author knows, only one other case of leprosy has been seen in Connecticut in recent years. The case was a Greek from Thessaly, aged 20, who came to New York in 1912 with the characteristic lesions of well developed nodular leprosy. The Wassermann reaction was positive, and the bacilli were readily demonstrated in smears of nasal mucus and in a nodule.

The chief interest in the case lies in the fact that the patient had been wandering about for a long time in New York, Pennsylvania and Virginia without his disease being recognised.

P. S. A.

Arrowsmith (H.). **A Case of Tubercular Leprosy involving the Upper Air Passages.**—*Laryngoscope.* 1916. Mar. Vol. 26. No. 3. pp. 188–189.

The patient was a girl of 15 with extensive nodular and pigmented lesions on the face, ears, trunk and limbs and numerous nodules on the mucous membrane of the mouth and nasopharynx; the epiglottis and arytenoids were largely infiltrated, but the larynx itself apparently free. According to the history there was no disease till three years before admission; its course must have been very rapid. Notwithstanding the extent of the growths, the patient complained of but little discomfort beyond some nasal obstruction and dryness of the throat.

We are not told her nationality, or whether she had been living in a leprosy district. Her brother came recently from Florida, with a macule on the leg which was considered to be leprosy.

P. S. A.

Rogers (Leonard). i. **Preliminary Note on the Intravenous Injection of Gynocardate of Soda in Leprosy. With Further Experience of its Subcutaneous Use.**—*Brit. Med. Jl.* 1916. Oct. 21. pp. 550–552.
ii. **Gynocardate of Soda intravenously in Leprosy.** [Correspondence].—*Indian Med. Gaz.* 1916. Nov. Vol. 51. No. 11. p. 437.

i. The author has recently recorded his encouraging results by subcutaneous injections of gynocardates in leprosy [see this *Bulletin*, Vol. 8, p. 245]. In this paper he describes his investigations carried out with the help of Dr. Sudhamoy Ghose on the fatty acids contained in chaulmoogra oil. Those with a low melting point constitute the so-called "Gynocardic acid" and he finds that their soluble soda salts can be safely given intravenously, being far less toxic than other preparations of chaulmoogra oil. They are obtained either from cold drawn chaulmoogra oil or from the buttery substance obtained by further compression of the seed of *Taraktogenos kurzii* with the aid of steam heat. He has been giving them intravenously in some 20 cases of well marked leprosy for six weeks with results which "show the intravenous route to present important advantages over the subcutaneous one"; the method is painless and more efficient. A two to three per cent. sterilised solution is employed, from $\frac{1}{10}$ to $\frac{4}{5}$ of a grain being given in each dose. "The more striking result is the occurrence of definite local reactions in the diseased tissues sometimes accompanied by fever, which has been seen in several cases after two to three-fifths of a grain have been given intravenously."

We shall await with interest a further report of the cases treated, as Sir Leonard says that the results so far are "decidedly encouraging."

ii. Sir Leonard Rogers reports that further researches have resulted in the use of a pure form of sodium gynocardate which can be safely injected intravenously. In several cases it has been followed by reaction, rise of temperature with swelling of thickened tissues, discharge of broken down bacilli and subsequent improvement. This method is far less painful than by the subcutaneous injection of the drug. Sterile ampoules containing the dose for intravenous use are now prepared by Messrs. Smith, Stanistreet & Co.

Sir Leonard repeats here that he makes no claim to cure leprosy, but that he has seen sufficient improvement in a number of cases to justify his recommending a careful trial of this treatment by others.

P. S. A.

HOPKINS (Ralph). **Observations on the Treatment of Leprosy with Special Reference to Chaulmoogra Oil.**—*New Orleans Med. & Surg. Jl.* 1916. Sept. Vol. 69. No. 3. pp. 223–232.

This is an important contribution to the subject. The author compares the results with chaulmoogra oil with other methods of treatment in 269 cases extending over a period of 15 years, since he has been visiting physician of the Lepers' Home of Louisiana. He makes due allowance for the improvement generally observed soon after admission to the Home, due to the better hygienic conditions, good nursing, etc., irrespective of treatment, as well as to the spontaneous disappearance of some lesions often observed and the occasional good effect of intercurrent diseases like erysipelas.

So strong has the conviction become that chaulmoogra oil is beneficial, that it is the routine practice to administer it to every case on admission to the Home. The disadvantages of its internal administration are the slowness of its action and the nausea often caused. Cases not too advanced and able systematically to take sufficient doses show a large percentage of improvement. In 14 cases the improvement has progressed to a point of complete disappearance of all lesions and bacillary evidence. The average time of cure was about three years.

Since 1913 the oil has been given hypodermically in nine cases according to MERCADO's formula with camphorated oil and resorcin, and recently VAHRAM's emulsion of chaulmoogra oil has been given intravenously in two cases with, so far, good results.

Of all other remedial agents the one that has best stood the test of time is Fowler's solution in diminishing the duration and severity of the lepra fever.

P. S. A.

TAKANO (R.). **The Treatment of Leprosy with Cyanocuprol.**—*Jl. Experim. Med.* 1916. Aug. Vol. 24. No. 2. pp. 207–211.

The author briefly reports his experiments with cyanocuprol in six cases of leprosy– four maculo-anaesthetic, and two mixed cases, the drug having proved of value particularly in the treatment of tuberculosis in animals. Contrary to the experience in tuberculous patients, no local or general reactions were caused. Twenty to twenty-four mgm. may be given weekly, by intravenous injections. Unless the injections be given very slowly and the patient be lying down, anaphylactoid symptoms may result after the fifth or a later dose.

In all these cases diminution of the lesions soon set in, macules fading, sensation returning, and nodules absorbing.

In only one case, which was complicated with pulmonary tuberculosis, the temperature rose and there was some dyspnoea.

The treatment, so far apparently beneficial, is being tried in a number of other cases.

P. S. A.

PELLAGRA.

GOLDBERGER (Joseph). **The Transmissibility of Pellagra. Experimental Attempts at Transmission to the Human Subject.**—*Public Health Rep.* 1916. Nov. 17. Vol. 31. No. 46. pp. 3159–3173.

A very important communication in which an attempt to settle the vexed question of the communicability of pellagra is described. There is a widely held belief, especially in the United States, that pellagra is a transmissible disease, but on examination the evidence in favour of this view fails to support this assumption and in many cases is susceptible of an entirely different interpretation. One investigation carried out by HARRIS (1913) who claimed to have successfully inoculated a monkey with a filtrate from pellagrous lesions, seemed to furnish direct evidence that the disease was communicable. Later observations, however, including those of HARRIS himself, failed to confirm this result and the question still remained an open one.

In order to throw further, and if possible, conclusive light on the subject, the author tested the infectivity of pellagra by experiments on an animal species highly susceptible to the disease, namely, man himself.

The experiments were carried out on 16 persons, one of whom was a woman. They varied in age from 26 to 42 years. No restraint of any sort was imposed; they were advised to continue their customary habits of life and diet and were permitted to travel freely in pursuit of their ordinary occupations. No attempt was made to avoid contact with known cases of pellagra. Several of the volunteers were medical men who by reason of their official duties came into intimate contact with pellagra in its natural environment.

The materials used in the experiment were obtained from 17 pellagrins and consisted of blood, naso-pharyngeal secretions, epidermal scales from pellagrous skin lesions, urine and faeces.

Scales, urine and faeces were administered by mouth; the blood was administered by intramuscular or subcutaneous injection and the secretions by application to the mucosa of the nose and nasal pharynx. Certain variations were also indulged in. In order to reduce gastric acidity and thus minimise any possible germicidal action of the gastric juice, the ingestion of material was preceded by a dose of sodium bicarbonate. The products were always taken on an otherwise empty stomach. The faeces, urine and scales were often administered together in the form of a pill made up with flour or bread crumbs.

The results strongly support the view that pellagra is not infective for, in spite of the drastic if somewhat repulsive procedures indicated, no symptoms of pellagra resulted in any case. A certain number of the subjects of the experiment were troubled with some flatulence and diarrhoea for short periods due probably to the ingestion of such large amounts of filth, but no untoward symptoms appeared during the four and a half to six and a half months that the subjects were under observation

H. Maclean.

Siler (J. F.), Garrison (P. E.) & MacNeal (W. J.). **The Subsequent History of Pellagrins in Spartanburg County, S.C., who survived the Initial Attack.**—*Arch. Intern. Med.* 1916. Sept. 15. Vol. 18. No. 3. pp. 340–375. With 9 text-figs.

In a preceding paper of this series, the initial attacks of pellagra in 1,180 cases occurring in Spartanburg County were discussed in regard to race, sex and age. The death-rate for these cases in the year of initial attack was 15·8 per cent. In the present rather lengthy paper the fate of the survivors of the initial attack of this same series is considered, particularly in regard to their freedom from recurrences, the appearance of these recurrences, the death-rate of recurrent attacks and the relation of these phenomena to the duration of the disease. The following conclusions were arrived at:—

"1. The total number of recorded recurrent attacks of pellagra in this series of patients was 1,053, with 130 deaths in the year of recurrence. The death rate in recurrence was therefore 12·3 per cent.

"2. The total number of instances of freedom from recurrent attack of pellagra during a year numbered 617. The ratio of nonrecurrence to recurrence was therefore 617 to 1,053, or approximately 4 to 7.

"3. For pellagrins in the later years of the disease the prognosis is more favourable for recovery from the present attack but apparently less favourable in respect to escape from recurrence in the next subsequent year. In other words, after successive annual attacks the disease seems to become more firmly established as a chronic disease with annual manifestations, but also becomes less acutely malignant.

"4. A year without recurrence is a very favourable omen. Subsequent recurrence is less likely to appear and if it does appear it is less likely to end in death.

"5. Recurrence after several years of freedom from the disease is not uncommon and a considerable proportion of these recurrences end fatally.

"6. It is impossible to say when a patient has definitely recovered from the disease pellagra. It seems to us very much more advisable to speak of recovery from the particular attack of the disease in a given year. In those patients who escape recurrence for one or more years it is best to consider the disease as arrested or as inactive, much as we do in tuberculosis or in syphilis."

H. M.

Siler (J. F.), Garrison (P. E.) & MacNeal (W. J.). **The Relation of Recurrent Attacks of Pellagra to Race, Sex and Age of the Patient and to Treatment of the Disease.**—*Arch. Intern. Med.* 1916. Nov. 15. Vol. 18. No. 5. pp. 652–691. With 10 text-figs.

A study of the correlation between recurrence of pellagra or escape from recurrence on the one hand, and race, sex and age on the other hand. This study was undertaken with the hope that the results might contribute to the elucidation of the problem of prognosis in pellagra. The results obtained are summarised as follows:—

"1. The tendency to recurrence was approximately equal in the two sexes and in the two races considered, the percentage of years with recurrence being 62·4 for white females, 63·1 for white males, 69·4 for negro females and 64.3 for negro males.

"2. The death-rate in recurrent attacks was 12·3 per cent. for the whole group of pellagrins considered, being considerably below the death-rate in initial attack of pellagra for the same group, which was 16·2 per cent.

"3. The death-rate in recurrent attacks was 9·4 per cent. for white females, 14·9 for white males, 27·9 for negro females and 44·4 for negro males, the variation corresponding roughly to the difference in mortality observed in initial attacks in these groups.

"4. White girls who had their initial attack of pellagra before the age of 10 showed a recurrence rate of 46·7 per cent. Those with onset in the second decade of life had a recurrence rate of 67 per cent. and the women with onset at from 20 to 50 years suffered recurrence in 63·5 per cent. of the years for which there are recorded observations. The recurrence rates for the white males with onset in the same age periods were 44, 31·6 and 71·1 per cent, respectively.

"5. Recovery from pellagra is much more frequent and more permanent in children than in adults.

"6. Recurrence of pellagra after one or more years of freedom from attacks is not uncommon. This phenomenon is especially noticeable in white females of child-bearing age.

"7. As compared with initial attacks, recurrences of pellagra are relatively less common in white children because of their tendency to recover and in the colored race because of their high death-rate in year of initial attack. Recurrent attacks are relatively more numerous in white men over 44.

"8. There is a definite indication of increased resistance to recurrence at about the age of puberty in both sexes of the white race. This resistance is very evanescent in females but continues into the third decade of life in males.

"9. The hygienic-dietetic treatment has given good results as far as recovery from the acute attack is concerned. Subsequent recurrence has been observed in a large majority of such cases.

"10. Pellagrins who have recovered from very severe attacks seem less liable to recurrence in subsequent years.

"11. General measures to increase the resistance of the patient should be continued for at least a year after recovery from the acute attack. Physiologic rest, diet and tonic drugs, as well as strict personal hygiene, should be employed.

"12. The successful treatment of complicating disorders is very important in the successful management of pellagra."

H. M.

SILER (J. F.). GARRISON (P. E.) & MACNEAL (W. J.). **An Experimental Test of the Relation of Sewage Disposal to the Spread of Pellagra.** —*Proc. Soc. Experim. Biol. & Med.* 1916. Vol. 14. No. 2. p. 28.

The community of Spartan Mills in the city of Spartanburg S.C. constituted an endemic centre for pellagra. Surface privies here were replaced by a water carriage system of sewage disposal in the latter part of 1913 and the beginning of 1914. This measure was followed by a great reduction of the disease so that in the pellagra season of 1916 only one new case appeared among the 2,000 residents on the Mill property. Many of those, however, who were pellagrins had recurrences in 1916. The improvement in sanitation seemed to prevent the non-pellagrous part of the population from contracting the disease, but not to affect the course of the disease in those already suffering.

H. M.

SHAW (Thad). **Pellagra: Its Causation and Alleviation.**—*Amer. Med.* 1916. Nov. Vol. 11. New Ser. No. 11. pp. 779–782.

The author believes that the etiology of pellagra is to be found in nutritional deficiency, though adverse circumstances such as poverty and bad hygienic conditions play a part. In this connection, it is pointed out that when poverty was rife in France in the reign of Napoleon I. pellagra flourished; later, when France became prosperous, the disease gradually disappeared and is now very rare. The possibility of an increase in the incidence of pellagra due to the economic pressure caused by the war is referred to. The author favours GOLDBERGER'S* view as to the etiology of pellagra and rejects the parasitic and infective theories. Treatment on the usual lines with plenty of fresh meat is recommended. H. M.

RICE (H. W.). **The Etiology of Pellagra in Children—A Study of Two Hundred Cases in Orphanages.**—*Southern Med. Jl.* 1916. Sept. Vol. 9. No. 9. pp. 778–785.

A consideration of certain data obtained in an epidemiological study of 200 pellagrous children in orphanages. The investigation furnished no evidence that corn played any part in the etiology of the disease. Some apparent relation between the amount of animal food consumed and the spread of pellagra was obtained; on the whole the cases appeared to be less numerous in institutions where plenty of fresh meat was given.

The incidence of pellagra was much higher in children under 12 years of age, but this could not be accounted for by difference of diet. The liability to develop the disease was found to be three times greater during the first year in an orphanage than during any subsequent year. Unsatisfactory hygienic conditions, insects, etc., appeared to play no part in the etiology of the disease though the usual predisposing causes such as age, sex, hereditary weakness, poor nutrition and coincident diseases were obviously operative.

H. M.

YARBROUGH (J. F.). **Pellagra: Its Etiology and Treatment.**—*Med. Record.* 1916. Sept. 2. Vol. 90. No. 10. pp. 416–418.

In a former paper [see this *Bulletin*, Vol. 8, p. 343] the author expressed the view that pellagra was an auto-intoxication caused by a diet too rich in carbohydrate. This carbohydrate was converted in the stomach into what distillers call "sour mash," and the products of this abnormal process were absorbed into the blood stream, giving rise to the symptoms of pellagra. As a result the blood of the pellagrin became acid. To counteract this acid intoxication, an exclusive protein diet was recommended: this was combined with fairly large doses of dilute nitric acid, a remedy recommended by DEEKS in 1913.

In the present paper an attempt is made to substantiate these claims by introducing clinical data which, in the author's opinion, supports them. Emphasis is laid on the statement that the cure of pellagra can never be accomplished by dietetic measures alone, but the necessary strictly protein diet must be accompanied by medicinal treatment in the form of nitric acid. A partial explanation of the rationale of the suggested treatment is given, in which the statement is made that in pellagra the blood becomes "acid" and that this acidity is counteracted by the ingestion of nitric acid.

[It is difficult to understand, as the author admits, how a product such as nitric acid can render the blood alkaline, but as the question is being investigated by "one of America's foremost biological chemists," the results will be awaited with some interest. The author furnishes no evidence whatever in support of his statement that the blood in pellagra becomes "acid," nor does he define with any accuracy what he means by acid blood. In the light of recent work carried out on other diseases it is certain that pellagra blood does not become acid in the true and modern sense of the word, though its potential alkalinity may be, and probably is reduced. In sudden transmission from a mixed diet to a strictly carbohydrate-free protein regime, there is generally a temporary increase of organic acids in the blood of even healthy individuals and no doubt this condition must have existed in the author's patients. The general clinical history of pellagra does not indicate that the disease itself produces acidosis and coma, as might be expected if the author's hypothesis were correct. The three cases brought forward in support of the nitric acid treatment are interesting but not convincing, since the number is too small. If nitric acid has any specific action in pellagra (and of this there is no real evidence) it probably acts in some other manner than that propounded by the author (see also CONNOR, this number, p. 227).]

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* See this *Bulletin*, Vol. 7. pp. 51, 52. 309; Vol. 8, p. 339.

H. M.

PERDUE (J. D.). **Pellagra: A Brief Resume of Known Facts.**—*Amer. Med.* 1916. Nov. Vol. 11. New Ser. No. 11. pp. 777–779.

This paper describes, in a brief and comprehensive manner, the symptoms and treatment of pellagra. Attention is drawn to the fact that pellagrins in many cases emit a very characteristic odour, probably caused by saprophytic bacteria; this odour may sometimes be of value in diagnosis. In the treatment of the disease, a liberal diet consisting largely of protein but containing some carbohydrate is advocated, together with medicinal remedies which include nitric acid, copper arsenite, sodium cacodylate and other drugs.

[It is interesting to note that the auther uses nitric acid in treatment as recommended by YARBROUGH (see above), but contrary to the instructions of the latter allows a certain amount of carbohydrate. No results of the treatment are furnished.]

H. M.

SMITH (W. Atmar), POLLITZER (R. M.) & MUSTARD (Harry S.). **Pellagra in Charleston, S.C.**—*Southern Med. Jl.* 1916. Sept. Vol. 9. No. 9. pp. 786–790.

From a careful study of pellagra as it occurs in Charleston, S.C., the authors believe that this town constitutes an endemic focus in which sporadic cases have occurred for many years; the disease is steadily on the increase. The mortality is much higher in the negro than in the white, and in females than in males. Bad hygienic and overcrowded conditions play some part in the disease.

H. M.

JELKS (John L.). **Some Interesting Features concerning the Study of Pellagra.**—*Pacific Med. Jl.* 1916. June. Vol. 59. No. 6. pp. 353–358.

The author appeals to investigators to cast away all preconceived ideas as to the etiology of pellagra and to continue their researches with unbiassed minds. This excellent advice, however, is followed by certain dogmatic statements that pellagra is an infectious, bacterial disease, the symptoms of which are due to toxic products of bacterial origin. It is suggested that amoeba may in some cases be the precursor "paving the way by breaking the continuity of the gut or may indeed be the host." At any rate, the author is quite certain that pellagra has nothing whatever to do with diet or deficiency of any substance necessary for life.

[The author's view that pellagra is infectious is entirely opposed to the recent results of Goldberger [this number, p. 222).]

H. M.

Connor (Ronald C.). **A Review of Pellagra Cases admitted to Ancon Hospital and Discussion regarding Etiology and Treatment of Pellagra.**—*Proc. Med. Assoc. Isthmian Canal Zone.* Apr. to Dec. 1915. Vol. 8. Pts. 1 & 2. pp. 155–163.

An account of cases of pellagra, occurring in the Panama Canal Zone, which were admitted to Ancon Hospital between 1909 and 1915 inclusive. Pellagra was first diagnosed in this region in 1909 and since that time its incidence has steadily increased, although the hospital records mentioned show no definite rise in the number of cases. Of the 76 cases of pellagra admitted during the above period the number per year was as follows :—

1909	1
1910	0
1911	12
1912	14
1913	13
1914	15
1915	21

Among these cases there were 19 deaths. The treatment adopted consisted in adhering as far as practicable to a carbohydrate-free diet comprising meat, milk, soups, etc. Nitric acid and various other drugs were used but no better results were obtained with nitric acid than with other remedies (cf. Yarbrough, above). The etiology of pellagra is discussed but no new suggestions are made.

H. M.

Tucker (B. R.). **Pellagra.**—*Internat. Clin.* 1916. 26 Ser. Vol. 1. pp. 64–78. With 1 plate.

A general survey of pellagra in all its aspects. The etiology of the disease is fully discussed as well as certain pertinent points as to the relation of the disease to poverty and other factors. [The paper is a useful resumé of much of the recent work published on pellagra but contains nothing new.]

H. M.

Burr (W.) & Cadwalader (W. B.). **A Case of Pellagra, with Autopsy, in a Child.**—*Jl. Nerv. & Ment. Dis.* 1916. Vol. 43. pp. 539–545. With 1 text fig.

A report of a case diagnosed as pellagra in which marked spinal symptoms were present; the patient died suddenly. On post-mortem examination nothing of importance was noted; it is stated that the pancreas was hard, nodular and slightly haemorrhagic and the brain somewhat oedematous.

On microscopic examination marked changes were found in the spinal cord, especially in the thoracic region; diffuse degeneration of the white matter together with degenerative changes of the anterior cells was observed. The posterior roots appeared to be normal. Other changes in the region of the fourth ventricle and nerve roots are also described.

H. M.

RIVISTA PELLAGROLOGICA ITALIANA. 1916. July & Sept. Vol 16. Nos. 4 & 5. pp. 58–61 & 74–76.—**Commissione Pellagrologica Provinciale di Vicenza. Relazione sui provvedimenti profilattici e curativi attuati durante l'anno 1915.** [Prophylactic and Curative Measures carried out by the Provincial Commission of Vicenza during the Year 1915.]

An account is given of the measures taken during the year 1915 to reduce pellagra. The Commission has carried on propaganda to lessen the amount of maize in the diet of the peasant class. In this they have been assisted by the rise in the cost of maize. Their customary inspection of the maize of commerce has been continued. Much of the report deals with the kind of crops which may suitably be grown in lieu of maize. Contrary to expectation, the unfavourable economic conditions produced by the war have not led to an increase of pellagra.

H. M.

FUSCHINI (Carlo). **L'Agricoltura contro la Pellagra. Sunto di Co[illegible]renze popolari tenute per incarico della Commissione Pellagrologica dell' Umbria.** [Summary of a Popular Conference held by Command of the Pellagrological Commission of Umbria.]—*Riv. Pellagrolog. Ital.* 1916. Nov. Vol. 16. No. 6. pp. 84–89.

A general account of pellagra in which the "spoilt maize intoxication" theory of its origin is adopted. Substitution, as far as possible, of maize by barley in human food and the use of a mixed diet are urged as preventive measures. It is suggested that the cultivation of maize should be restricted, that an early variety of maize should be grown and that the product should be carefully sun-dried. Advice is given as to the crops which may be suitably cultivated instead of maize.

H. M.

ANTONONI (G.). **La Pellagra e l'avvenire del proletariato agricolo.** [Pellagra and the Future of State Agriculture.]—*Riv. Pellagrolog. Ital.* 1916. Nov. Vol. 16. No. 6. pp. 81–82.

Many years ago, the author published a diagram showing the parallelism between the increase of pellagra and the price of grain. Owing to the higher cost of living, following the outbreak of the European war, an increase in the incidence of pellagra was expected. No such increase, however, has resulted. It is suggested that in the further development of State Agriculture lies the solution of the pellagra problem.

H. M.

KALA AZAR.

CORNWALL (J. W.). **A Contribution to the Study of Kala Azar (II).**—*Indian Jl. Med. Res.* 1916. July. Vol. 4. No. 1. pp. 105–119. With 1 plate.

For the review of the first part of this contribution see this *Bulletin*, Vol. 8, p. 403. The second part now under consideration is divided into six sections as follows :—

" 1. Can the bug transmit the infection of Kala-azar :—
  (a) *by biting,*
  (b) *through the medium of its faeces,*
  (c) *by being devoured by some other insect or by a vertebrate ?*
" 2. The formation of the thick-tailed stage in the life-history of *Leishmania donovani* and of *L. tropica.*
" 3. *Conorhinus rubrofasciatus* as a carrier of *L. donovani.*
" 4. Further experiments on the effect of serums on flagellates of *L. donovani.*
" 5. Observations on a case of Oriental sore.
" 6. Concerning the value of the method of feeding biting insects artificially."

1. (*a*) Further experiments, similar to those set out in the previous communication were made. These point to the conclusion that *Cimex rotundatus* cannot transmit either kala azar or oriental sore by biting.

(*b*) Viable forms of *L. donovani* and *L. tropica* are apparently not passed in the faeces of *Cimex rotundatus.* Degenerated forms and free flagella are found in the intestine and rectum.

(*c*) " Infected bugs may be devoured by some other insect or by a vertebrate and the infection somehow passed on to man. If no such bug-eater which is capable of transferring the infection can be found some insect host other than the bug must be sought for."

2. " Thick-tails [*loc. cit.* p. 405] appear only on the association of flagellate culture with the stomach or intestinal mucous membrane of Cimex." They are found both when *L. donovani* and *L. tropica* are employed. They are not seen when the stomach of rabbits, fleas (*Xenopsylla*), *Conorhinus rubrofasciatus*, or ticks (*Magaropus*) is used.

" It appears that we may have two kinds of thick-tail, one formed as a preliminary to encystment, the other when de-encystment is taking place The first kind is seen when flagellates come into contact with the mucous membrane of the bug's stomach ; the second may or may not occur normally in the bug's stomach, but can be induced artificially in a few minutes by diluting the stomach contents of an infected bug with salt solution."

3. " *Leishmania donovani* flagellates do not flourish in the stomach of *Conorhinus rubrofasciatus.*"

4. The previous experiments had been conducted with equal parts of serum and flagellate culture in a hanging drop. In this further series one volume of culture was mixed with five volumes of serum in a pipette. The pipette was left at laboratory temperature for 24 hours and then microscopically examined. The conclusions arrived at were : " The fresh serums of man, goat, sheep and guinea-pig are all inimical to flagellates of Leishmania ; those of rabbit, dog, hen, and cat seem to have little ill-effect. The inimical action of a serum is destroyed by heating it to 55° C. for 30′."

5. Eight bugs were fed on an Oriental sore (from which flagellates were obtained on culture), some near the margin, others near the centre. They were kept at a temperature of 22–25° C. and dissected at intervals up to the 13th day with negative result. Two weeks later, twenty bugs were fed on the sore, half of them being kept at 18–20° C. and half at 22–25° C. Subsequent dissections proved negative though the sore was shown to be still heavily infected.

Cimex is unable to suck up tissue cells through its proboscis. The parasites being all intracellular, the bug is unable to infect itself unless they are present in the circulating blood and cannot do so directly by biting the lesion.

6. "The method of feeding insects artificially is capable of wide application."

E. J. Wyler.

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da Matta (Alfr.). **Tableau synoptique de la classification des leishmanioses.**—*Bull. Soc. Path. Exot.* 1916. Dec. Vol. 9. No. 10. pp. 761–762.

In deference to the views of other workers the author has modified his classification of leishmaniasis as set out in a previous paper [this *Bulletin,* Vol. 8, p. 407]. His present classification is as follows :—

- Leishmaniases
    - Skin
        - Cutaneous
            - Hypertrophic (non-ulcerating)
                - Nodular.
                - Papillomatous or miliary.
                - Macro-tuberculiform.
                - Pseudo-verrucous.
            - Ulcerating
                - Oriental sore.
                - Atrophic.
                - Circinate.
                - Lymphangitic.
                - Phagedenic.
        - Muco-cutaneous
            - Pseudo-papillomatous.
            - Cancerous or phagedenic.
    - Visceral
        - Tropical leishmaniasis or kala azar.
        - Infantile kala azar.

E. J. W.

Aravandinos (Anast.). **Beobachtungen über die innere Leishmaniosis in Griechenland.** [Internal Leishmaniasis in Greece.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1916. Apr. Vol. 20. No. 8. pp. 193-203.

A large part of the paper is taken up with the microscopic appearances in the case of a child aged two and a half years which died of kala azar. The author draws attention to the occurrence of anaemia in children with enlargement of the spleen, in which, however, no parasites are found on puncture [see this *Bulletin,* Vol. 8, p. 1].

Mention is made of three cases of Mediterranean kala azar in which treatment by transfusion of blood from cases of Oriental sore was tried.

Some days before the transfusion the kala azar patients received an intravenous injection of "606" with the idea of so injuring the parasites as to make them susceptible to the action of antibodies in the blood of the *L. tropica* cases. The results were negative, though in one instance—a boy, six years of age—there was marked decrease in the size of the spleen with disappearance of the pyrexia. This improvement, however, only lasted two weeks.

The author advises the prohibition of dogs, as a prophylactic measure in those islands of the Grecian Archipelago where the disease is endemic.

The special susceptibility of young children to the disease is ascribed (i) to their close association with domestic animals (dogs); (ii) to their undeveloped "resistance"; (iii) to playing on the floor and spending long hours in bed, for both of which reasons they are much exposed to insect bites.

E. J. W.

ROGERS (Leonard). **Further Cases of Kala-Azar in Europeans successfully treated by Intravenous Injections of Tartar Emetic.**—*Lancet.* 1916. Nov. 4. pp. 782–785. With 2 charts.

A detailed account of twelve further cases, making a total of eighteen.

For the review of the paper dealing with the six cases previously treated by the author and Captain N. H. HUME see Vol. 8, p. 3 of this *Bulletin.* Details of these are included in the paper under consideration. The salient features of all the 18 cases are shown in the table reproduced on the following page.

The results in the new cases "fully confirm the very sanguine expectations" formed from the smaller series.

As regards duration of treatment, the injections were in most cases "continued for from several weeks to two or three months after the fever had ceased and only stopped as a rule when the body weight had much increased, the spleen become considerably reduced, the blood had approached or reached the normal as regards both the red and the white corpuscles, and the parasites had disappeared from the spleen." It is pointed out that with the adoption of a more rapid increase of dosage, as tried in some of the later cases, the period of treatment may be reduced and that further experience may show an even shorter course to be efficient. It is recommended that treatment in adults be commenced with 4 cc. of the 2 per cent. solution, that 6 cc. be given at the second injection and that at each subsequent injection 1 cc. be added, if no toxic symptoms supervene, up to 8 or 10 cc. Two cases (Nos. 16 and 17) thus treated left hospital 65 and 50 days after treatment was begun. As regards the effect of treatment upon the fever, this may be expected to be controlled after from five to ten doses given every third day, or within about a month.

In discussing the effect on the blood it is remarked that "no case in which the leucocytes have reached the normal has relapsed in our experience so that a normal leucocyte count is likely to prove a reliable indication for stopping the injections of the antimony salt." Increase of the ratio of white to red corpuscles is of good augury, as also is the rapid gain in body weight which occurs as soon as the fever ceases. The spleen is not appreciably reduced in size until the temperature has been normal for some time.

Kala Azar in Europeans treated by Tartar Emetic.

Data before and after Treatment.

Number.	Age.	Duration before admission in months.	Time in hospital.	Duration of fever.	Tartar emetic to cessation of fever.	Total tartar emetic.	Maximum dose of 2 per cent. solution.	Enlargement of spleen below ribs.	Weight on admission: Gain or loss.		Red corpuscles.	White corpuscles.	Ratio of white to red.	Parasites.	Result.
			Days	Days	cgm.	cgm.	cc.		lb.	oz.					
1	18	1½	226	64	140	149	9	To navel. Just felt.	89 + 16	10 4	3,660,000 5,050,000	2,000 8,500	1-1830 1- 676	+ —	Cured.
2	28	5	64	45	96	124	8	To navel. 2 in.	109 + 17	8 12	2,990,000 ..	1,375 ..	1-2170 ..	+ —	"
3	23	6	372	..	51	56	4	3¼ in. 1 in.	91 — 3	0 0	2,960,000 3,220,000	1,125 1,125	1-2631 1-2862	+ —	Died of pulmonary phthisis.
4	36	12	214	35	78	326	10	To navel. 1 in.	96 + 22	10 4	3,850,000 5,160,000	1,125 10,250	1-3422 1- 503	+ —	Cured.
5	38	9	195	59	73	307	10	Navel+1 in. Just felt.	101 + 7	14 12	.. 5,120,000	2,000 6,750	.. 1- 578	+ —	"
6	28	4	229	145	332	580	11	8 in. 2 in.	108 + 15	0 12	3,430,000 3,500,000	1,000 6,500	1-3430 1- 538	+ —	"
7	32	8	179	56	180	250	10	2¼ in. ..	83 + 31	8 0	1,740,000 3,500,000	875 6,250	1-1989 1- 580	+ —	"
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	124	314	[illegible]	[illegible] [illegible] felt.	[illegible] + 24	[illegible] 2	[illegible] 5,050,000	500 5,250	1-6840 1- 918	+ —	"
9	38	18	73	..	..	243	10	Navel+½ in. Smaller.	132 — 1	4 4	4,240,000 4,150,000	3,125 5,000	1-1397 1- 880	+ ..	Improved.
10	13	3	161	123	223	243	10	4 in. 2 in.	63 + 14	4 12	4,090,000 5,010,000	2,375 4,250	1-1722 1-1178	+ —	Cured.
11	17	3	114	51	66	254	10	Navel+½ in. 1½ in.	103 + 46	2 0	.. 4,480,000	.. 5,500	.. 1- 600	+ —	"
12	47	3	97	23	90	382	10	1¼ in. Not felt.	106 + 24	4 0	3,620,000 4,380,000	1,125 6,000	1-3218 1- 726	— —	"
13	20	1	144	42	75	362	10	4 in. Not felt.	76 + 18	8 0	3,620,000 4,690,000	1,125 9,250	1-3218 1- 507	+ —	"
14	48	3	36	35	188	..	10	1¼ in. ..	.. ..		3,940,000 5,040,000	1,500 2,000	1-2627 1-2520	+ ..	Greatly improved.
15	45	6	35	..	..	68	5	3 in. 2 in.	91 + 6	0 0	2,540,000 ..	750 ..	1-3387 ..	+ ..	Improved.
16	17	3	85	20	206	484	10	3½ in. Not felt.	83 + 7	0 0	3,500,000 5,210,000	2,125 10,250	1-1647 1- 508	+ ..	Cured.
17	36	9	..	13	42	..	10	6 in. Not felt.	100 ..	8	3,020,000 5,570,000	1,375 4,000	1-2197 1-1392	+ ..	"
18	30	4	..	36	86	..	10	2 in.	..		3,830,000	3,750	1-2197	+	Greatly improved.

Summarizing his results the author remarks that of the 18 consecutive cases, 13 were cured; 2 were greatly improved and still under treatment at the time of writing; 2 improved, left hospital prematurely; 1 died of phthisis. Cases are defined as "cured" when "the fever has completely ceased for two or more months, together with considerable gain in weight and a restoration of the blood, and especially of the white corpuscles to the normal, and decided diminution in the size of the spleen."

The author suggests that in view of his results "the use of tartar emetic appears to be worthy of further study in human trypanosomiasis and sleeping sickness in Africa."

E. J. W.

MUIR (E.). **Further Notes on the Treatment of Kala-Azar with Antimonium Tartaratum.**—*Indian Med. Gaz.* 1916. Oct. Vol. 51. No. 10. pp. 368–369.

For the author's first communication see this *Bulletin*, Vol. 8, p. 3.

About 100 cases have now been treated, with favourable results, the diagnosis in the majority being confirmed by finding the parasite in the blood or spleen.

There is often a marked reaction soon after the injection, in patients with a large number of parasites, the temperature rising to 103° or more, but falling again in about two hours. The reaction becomes less marked as recovery occurs and is not produced in patients not suffering from kala azar. Samples of antimony tartrate vary in purity, the less pure being liable to evoke "a very strong reaction, quite out of proportion to their therapeutic value."

The injections of tartar emetic should be supplemented by giving the drug by the mouth as a powder according to the following formula, when it is seldom found to cause vomiting:—Antimon. Tartar, gr. i, Acid Tannic. grs. iii, Sod. Bicarb. grs. iv. The powder is given every morning and, if well borne, also every evening.

Injections should be continued once a week for at least two months after fever has been absent for one month. For such patients apparently recovered, who could not conveniently present themselves for weekly treatment, injections of metallic antimony were used, the following method being employed:—

> "Two grains of metallic antimony is finely powdered. It is then mixed with 5 cc. of glucose syrup and ground up again in a glass mortar for about five minutes.
>
> "The whole is then boiled in a test-tube and shaken up and poured into the 5 cc. syringe, and at once injected into the vein. The antimony is so finely powdered that it almost all remains in suspension and enters the vein.
>
> "If the amount in the test-tube and syringe be measured it is found to be less than half a grain. Thus a little more than 1½ grains have been injected."

The author was led to use metallic antimony on the recommendation of Dr. BRAHMACHARI [*loc. cit.* p. 5] who claims, as one of the advantages of this method, that fewer injections are required to produce a permanent cure.

E. J. W.

RAI HARI NATH GHOSH BAHADUR. **Further Reports of Recovery of Cases of Kala-Azar by the Intravenous Injection of a Compound Solution of Sodium Antimony Tartrate.**—*Calcutta Med. Jl.* 1916. Oct. pp. 97–104.

A description of four cases successfully treated by the intravenous injection of sodium antimony tartrate with sodium cinnamate and berberine hydrochloride.

A case of recovery by this treatment has been previously published by the author [see this *Bulletin*, Vol. 8, p. 6].

Attention is drawn to the occurrence in the urine of some patients of albumose. The author considers this to be a clinical feature of the disease.

E. J. W.

JACKSON (T.). **A Case of Kala-Azar treated by Intravenous Injections of Tartar Emetic at St. George's Hospital, Bombay.**—*Indian Med. Gaz.* 1916. Dec. Vol. 51. No. 12. p. 459. With 6 charts.

A case of a European girl aged 16 successfully treated by intravenous medication with tartar emetic according to the now well-known method.

The diagnosis was confirmed by spleen puncture.

An interesting feature of the case was its complication by an attack of benign tertian malaria, the infection being probably of old standing. Prior to the first intramuscular injection of quinine administered for this complication the recession of the spleen had apparently come to a standstill. "After the quinine treatment began the enlargement disappeared as if by magic."

E. J. W.

CANAAN (T.). **Die Jerichobeule.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1916. Mar. Vol. 20. No. 5. pp. 109–119. With 2 figs.

Oriental sore, confirmed by microscopic examination, is endemic in Jericho. Two cases (out of a total of 26 observed within two years) are described, in which the infection appears to have been undoubtedly acquired in the town.

Multiple lesions are the rule. Single sores are rare and it is unusual for cases to present less than four.

The infective seasons appear to be late autumn and especially late spring. A case is described in which treatment by neosalvarsan effected an almost complete cure within three weeks. There were 55 "quite typical" lesions, but it is not definitely stated that leishmania were found.

E. J. W.

LAVERAN (A.). **Singe patas infecté de bouton d'Orient.**—*Bull. Soc. Path. Exot.* 1916. Dec. Vol. 9. No. 10. pp. 749–750.

A young female monkey (*Cercopithecus patas*) was successfully inoculated from a mouse with *L. tropica*, the technique employed being that already described [this *Bulletin*, Vol. 8, p. 10].

Up to the present M. Laveran has produced Oriental sore in three other species of monkey, viz., *Macacus sinicus*, *M. cynomolgus*, and *M. rhesus*.

E. J. W.

Escomel (E.). Le traitement actuel de la Leishmaniose américaine. —*Bull. Soc. Path. Exot.* 1916. Nov. Vol. 9. No. 9. pp. 699–702.

The most successful present treatment of American leishmaniasis consists in the intravenous administration, combined with the local application, of potassium antimony tartrate.

The local treatment of the skin lesions is as follows :—

The ulcers are cleaned up with fomentations for 24 hours. The cleaned surfaces are then anaesthetized with a mixture of equal parts of cocaine, menthol and carbolic acid, sprinkled with finely powdered antimony tartrate, covered with sterile gauze and wool, and bandaged. On the following day the ulcers are wiped clean and an ointment of balsam of Peru 10 gm., oxide of zinc and oxide of bismuth āā 20 gm., white vaseline and lanoline āā 40 gm. is used. This is applied with pad and bandage every third day.

At the second or third dressing a slough will have separated, leaving an underlying deep violet surface. The treatment with powdered tartrate and consequent sloughing is repeated until a healthy bright red surface is left. From two to six such applications may be required.

In some cases local injections of cocaine or novocaine were used in addition to surface anaesthesia.

Good results were also obtained by applying the galvanocautery to the base and borders of the ulcerated surface after removal of the slough.

The local treatment of the mucous membrane lesions is as follows :—

Scabs are removed by lavage with a solution of bicarbonate of soda. The parts are then anaesthetized with a solution of cocaine 1 gm., distilled water 100 gm., carbolic acid crystals 1 gm., and sprayed with a 1–2 per cent. solution of tartrate in distilled water.

This treatment is carried out every one to three days according to the patient's susceptibility, but every 4–8 days the tartrate is used in saturated solution, the application being then made by means of a pledget of cotton wool.

E. J. W.

SNAKE BITE.

ACTON (Hugh W.) & KNOWLES (R.). **Studies on the Treatment of Snake-Bite.**—*Indian Jl. Med. Res.* 1914. July. Vol. 2. No. 1. pp. 46–148; and 1915. Oct. Vol. 3. No. 2. pp. 275–361. With 14 Charts.

This paper is a fine product of an exact experimental method at once well reasoned and profound; it throws the searchlight into many dark places, straightens some crooked ways, and is altogether illuminating and inspiring. To do it justice in an abstract is an impossibility; we can merely indicate the nature of its contents and select some of its practical lessons.

So far as it goes it consists of four sections. The first deals with the relative toxicy of different Indian venoms and their probable lethal dose for man, and has as its main object the elucidation of the true connotation of the term "snake-bite."

The second section contains careful estimates of the value of remedies of a mechanical or physical kind, and the third takes into very full and critical consideration the neutralizing power of locally applied chemical reagents, such as permanganates, hypochlorites, mineral chlorides, etc.

The fourth section, which is somewhat more speculative, though not a whit less penetrated with discernment and refined by experiment than the others, deals mainly with the biochemical aspects of the subject—the composition of venoms and the nature of their toxic elements, the nature and behaviour of their antitoxins, and all the paraphernalia of antivenene therapy.

After some sane and judicious prolegomena the authors commence operations by describing methods of making snakes render their venom, and computing the different amounts yielded by some of the commoner Indian species. Using for the most part fresh-caught snakes and milking them without delay, an extensive series of observations was made (the details being recorded in an appendix) from which the following means specific yields, expressed in milligrammes of desiccated venom, are calculated:—

Common cobra (50 observations) mean yield ..	317	mgm.
Common krait (48 observations) mean yield ..	8·17	,,
Banded krait (27 observations) mean yield ..	64·4	,,
Russell's Viper (6 observations) mean yield ..	108	,,
Echis carinatus (57 observations) mean yield ..	18·39	,,
Lachesis gramineus (15 observations) mean yield	30	,,

The practical purpose of accurate knowledge on this point is obvious.

The yields from three specimens of *Callophis macclellandii* were respectively 0·2, 2·0 and 6·0 mgm.; and from two specimens of King Cobra 100 and 195·5 mgm.; but as the latter were not full grown, and seem not to have been fresh caught, these yields can hardly be normal; at any rate, the authors' inference that the King Cobra is probably less prolific in venom than the cobra is not supported by an isolated observation of the reviewer, made more than twenty years ago, on a large new-taken specimen of the former species.

After describing very precisely the anatomical mechanism of the bite, and after discussing some discrepancies in a commonly accepted doctrine that the relation between the body-weight of a toxified animal and the time-effect of the toxin is a direct and simple one, the questions of the comparative toxicy of different species of venoms and of minimum lethal dose are considered, with particular reference to *subcutaneous absorption* as being most nearly concordant with the ordinary issues of snake-bite in medical practice.

As regards comparative potency of venoms the authors' work is in the main of a confirmatory kind, but some of their observations are new, or suggest novel interpretations. Thus in cobra venom, besides the haemolysin and the prepotent neurotoxin, an element that stimulates cardiac contraction is inferred, revealing itself particularly in a case (treated by permanganate, and by antivenene, ozone, and artificial respiration) in which the patient's heart continued to beat for two hours after the last spontaneous act of breathing. The venom of the King Cobra—practically identical with that of the cobra—is for monkeys more and for rats less toxic than the latter. That of the common krait is more profoundly neurotoxic than the cobra-product, convulsions being less manifest and recovery after severe symptoms being a rare event, though the time-effect is later. That of the banded krait is intermediate between cobra and common krait. The action and the minimum lethal estimate of Russell's viper venom, administered subcutaneously, may be obscured by the possibility of local thrombosis and occlusion. The minimum lethal dose of *Echis carinatus* venom for a monkey of 5,300 gm. was found to be 0·5 mgm. or less. These are just a few interesting points.

The estimates of the minimum lethal dose *for man* of the different species of venoms have been compiled with much ingenious labour which, however, can here be followed only in principle. The first step was to obtain as a standard of comparison the M. L. D. for man of one particular species, the common cobra. This has been estimated by LAMB as 15 to 17·5 mgm., by CALMETTE as 10 mgm., and by FRASER as 31 mgm., but the authors naturally base their edifice of inference on foundations of their own construction.

To arrive at the required standard they first of all studied from classical authorities a considerable number of fatal cases of cobra bite —all either untreated or treated by methods that could not have influenced the result—in which the time of infliction of the bite and the time of the fatal issue are recorded approximately, in order that they might get a series of measured time mortalities, or "death periods."

They next infer that since in experiments with cobra-venom and lower animals the relation between the "death period" and the amount of the toxic dose can be shown in the form of an asym-ptotic curve, a similar toxicy-curve capable of mathematical treatment, can be plotted for man from authentic clinical data; and by ultimate mathematical calculations they find that the subcutaneous dose of cobra venom that should *just fail* to kill a man of standard weight is 13·6 mgm. and so assume that 15 mgm. would be just fatal.

Having thus established a minimum lethal dose of 15 mgm. of cobra-venom as a standard of comparison, the authors fix the probable minimum lethal doses of other species of venoms by another reasonable postulate, and that is that the relative potency of these other venoms upon monkeys—as determined by a series of experiments—holds good for man also. On this assumption they estimate the minimum lethal dose (expressed in milligrammes of desiccated venom, and administered by *subcutaneous injection*) of the several following venoms to be for man:—*Naja tripudians*, 15; *Naja bungarus*, 12; *Bungarus candidus*, 1; *Bungarus fasciatus*, 10; *Vipera russellii*, 42; *Echis carinatus*, 5; *Lachesis gramineus*—an amount probably greater than this snake could shed at a given moment.

Having fixed, approximately, the M. L. D. of these venoms for man by subcutaneous injection, the authors proceed to estimate the amounts of venom that these several species of snakes may inject at a bite—a question of the greatest importance. They give reasons for assuming that these amounts may be taken as two-thirds of the mean of a large series of experimental yields of "milkings," and estimate them as follows, in milligrammes of desiccated venom: -*Naja tripudians*, 211·3; *Bungarus candidus*, 5·4; *Bungarus fasciatus*, 42·9; *Vipera russellii*, 72; *Echis carinatus*, 12·3; *Lachesis gramineus*, 14. The estimate of 100 given for the King Cobra (*Naja bungarus*) surely requires further investigation. In the above estimates it is assumed that the snakes are healthy, and in full natural vigour—not exhausted, or captive, or roused from hibernation. The authors however remind us of contingencies that may prevent or hinder lodgement of venom in the bite—e.g., failure to close the jaws, deficient elevation of fangs, mal-apposition of orifices of poison duct and fang, also starting of the victim, shaking off the snake before it has shut its jaws, interference of clothing, all important points in the prognosis of snake-bite.

Having thus greatly clarified and concentrated our ideas of snake-bite, the authors proceed to the subject of treatment, and particularly to treatment by ligature, by amputation, etc., and by the local injection of chemical reagents. And here again by exact experimental methods they introduce rule and order into what has too often been a confused ferment of conflicting opinion.

As regards simple ligature, the animals used were rabbits; lethal doses were injected hypodermically into the distal part of a hind leg, and a ligature was applied *immediately* and kept on for 20 minutes; unligatured rabbits were used as controls. In the experiments with cobra venom the "death period" was delayed by ligature. In the experiments with Russell's Viper venom, not only was the "death period" prolonged and not only was it found that ligature might lock up the venom *in situ* and so localize its action, but 7 of 23 ligatured rabbits that received doses varying from 5 to 20 mgm. survived, the controls in all but one of the 7 dying. The ligature recommended is ⅜ inch rubber tubing. The authors therefore conclude that an efficient ligature *if applied at once* is always of value as, at the very least, it provides more time for the employment of systemic remedies and gives the latter more opportunity for action.

As regards simple amputation (without ligature) anaesthetized dogs and monkeys were used, and cobra venom was injected, subcutaneously as far as the situation admitted, into the tip of the tail, and the tail amputated at intervals in successive cases of 1 minute up to 10 minutes. In not one of four dogs, each of which received many M. L. D., had amputation any effect. Of ten monkeys each of which received 10 M.L.D. and suffered amputation from one up to ten minutes afterwards, nine survived, though three of them had severe symptoms. The authors therefore conclude that simple amputation would be of value in the case of bites on fingers or toes, if it be done within a few minutes.

A few experiments on the effect of compression of limb were made, and these as well as incision, excision of bite, electrolysis, irradiation, cauterization, and bleeding and perfusion are all discussed and fairly criticised, but are dismissed as at best ineffective.

The experimental work on local remedies is particularly full and illuminating, but only the bare results of some of the many ingenious experiments recorded, and the general inferences drawn, can now be noticed.

Using rats and subcutaneously administered lethal doses of cobra-venom followed immediately by injections of solutions of potassium permanganate, zinc permanganate, calcium permanganate, gold chloride, and iodine trichloride, a 5 per cent. solution of gold chloride was inferred to be the most powerful local neutralizer of the venom as estimated by prolongation of the " death period."

Prior work on potassium permanganate is reviewed, and the authors take pains to confirm the statement that the *intravenous* injection of this salt is not merely useless but intrinsically dangerous, so little as 5 cc. of a one per cent. solution so administered to a rabbit having caused immediately fatal thrombosis. After due experiment the authors consider the Lauder-Brunton snake-bite lancet " wholly unreliable."

In their experiments to determine the exact effect of the several local neutralizers the authors used monkeys; a measured quantity of venom was dissolved and injected strictly subcutaneously, and *immediately* afterwards a measured strength of the neutralizing agent was injected into the very site with another needle. The following is a bare summary of the results for cobra venom (for viperine venoms the results were even better) :—

In 24 experiments, conducted as outlined above, with 10 cc. of a 5 per cent. solution of permanganate (K, Zn, Ca) there were 10 survivors, one of which had received 80 mgm. of venom.

Iodine trichloride, 5 per cent. solution of the fresh-made salt, gave as good results as permanganate.

In five experiments with 10 cc. of a 5 per cent. solution of gold chloride there were four survivors from doses of 20 to 80 mgm. of venom.

In five experiments with 10 cc. of a 5 per cent. solution of gold chloride injected after a delay of three minutes there were three survivors from doses of 20 to 60 mgm. of venom.

Subcutaneous injection of strong solutions of these neutralizers is not like intravenous injection dangerous, but it causes local gangrene. Their neutralizing action is purely local, acting only on the venom that they can reach *in situ* ; they have no effect upon any venom that has been absorbed into the circulation.

The authors' conclusions then are that these local remedies are of undoubted value in treatment if they can be injected *at once* before a fatal amount has been absorbed, but they are of no use whatever in a case of snake-bite seen some hours after the occurrence. When injected *at once* (and especially when an efficient ligature is applied at the same time) they can be relied on to destroy such venom as they come in contact with. The best of them is a 5 per cent. solution of gold chloride.

Having searched out experimentally, with proper controls, the value, and emphasized the limitations, of local remedies, the authors enter by the same arduous experimental road as far as possible, and with the same discerning eye, and also with an admirable dialectical skill, a difficult biochemical territory, into the rarified heights of which, where they are engrossed not so much with the direct therapeutic uses of antivenenes as with the exact nature, composition, and interactions of the toxic and anti-toxic principles we shall not attempt to follow them. Out of the chemical analyses of venoms and investigations of the nature of the antivenomous essence, a few facts and conclusions may be picked that can easily be focussed by the coarse adjustment. Thus by reference to earlier experiments and by fresh experiments with tissues *in vitro* the authors collect evidence that the neurotoxin of cobra venom is absorbed quickly but is not fixed quickly or firmly, whereas with the venom of Russell's viper absorption is slow but fixation is firm; hence - and direct experiment is confirmatory— delay in administering antivenine is dangerous in viper bite, but not necessarily so in cobra bite. Again the union of venom and antivenene *in vitro* is instantaneous. Another point of practical interest upon which the authors' experiments give instruction is that in cobra-bite half-hourly intermittent doses of antivenene give almost as good results as administration of the whole dose at once, whereas in Russell's viper-bite the whole dose should be given at once—for man 50 to 100 cc. intravenously, or 100–200 cc. intraperitoneally. In connection with the known weakness of antivenenes the question of strengthening them by concentration or by "activation" is discussed with an eye to further investigation.

We may conclude with an account of the authors' experiments to test in the severest manner the practical application of their several lines of research. Six monkeys were inoculated subcutaneously, each with 25 lethal doses of cobra venom. Three minutes afterwards a ligature was applied and was kept on for 20 minutes. *After* the ligature was removed (i.e., 23 minutes after inoculation) 10 cc. of a 5 per cent. solution of gold chloride were injected into the site of inoculation. Thirty minutes afterwards doses, varying from 20 to 60 cc. of antivenene were injected intraperitoneally. Of these six monkeys five survived and one died after an interval of 80 minutes. Three controls were inoculated each with 25 lethal doses at the same time; one of them received no treatment, and died in 43½ minutes; a second was treated with the ligature only, and died in 57½ minutes; the third was treated with the ligature and the gold chloride, but not with any antivenene, and though it suffered severely it survived. Of the five survivors of the complete experiment four which had, some 20 and some 40 cc. of antivenene showed "very slight symptoms" and one (which had 60 cc. of antivenene) had no symptoms at all.

The valuable instructions for the treatment of snake-bite, towards the end of the paper, need not be summarized, but we may quote the "Final Conclusion" which is as follows:—

> "(1) Apply a firm ligature immediately.
>
> "(2) Impregnate the whole area of the bite with a hypodermic injection of a strong solution of gold chloride.
>
> "(3) Inject from 100 to 200 cc. of antivenene intravenously, if the biting snake be suspected to have been a cobra or Russell's viper. If symptoms of venom intoxication come on, further and even larger injections of antivenene should be given intravenously.
>
> "With sera concentrated 10 times, a dose of 20–60 cc. should save every case of cobra bite."

A. Alcock.

MISCELLANEOUS.

CARTER (D. W.). Jr. **Hematochyluria. Observations on the Fat Content of the Urine and the Pathology of the Condition.**—*Arch. Intern. Med.* 1916. Oct. 15. Vol. 18. No. 4. pp. 541–550. With 3 text figs.

The patient was a Barbadian mulatto, aged 27, who had left Barbados twelve years. In 1903 one testicle became enlarged. In 1911 and on four occasions later he had acute retention of urine. The urine on admission, in 1914, was reddish brown and turbid, albumin 0·2 per cent. It separated, after a gelatinous stage in many specimens, into a narrow, bright red zone, a pinkish white zone and on top a narrow milky zone; no filaria embryos were found. A differential blood count showed 25 per cent. eosinophiles. Repeated blood examinations, day and night, failed to discover filaria embryos. The temperature was irregularly remittent. A full account is given of the case with the results of a cystoscopic examination. Improvement, with cleared urine, followed an intravenous injection of salvarsan.

The fat percentage of the urine was estimated, by ether, at each voiding between September 14th and November 2nd, as is shown in a table. Other, graphic, tables show the total daily amount of fat ingested, the output of fat in the urine and the quantity of urine, under fat-poor and fat-rich diets. The pathology of this and other cases is discussed. The summary is as follows:—

> "In a patient with chyluria the fat content of the urine varied markedly with the fat content of ingested food. On a fat-poor diet it averaged 0·35 per cent. and on the house diet it rose to from 1 to 1·4 per cent. With diet containing a daily average of 66·39 gm. of fat the average daily output of fat in the urine was 6·45 gm. The amount of fat in the urine, however, did not increase in direct proportion to the amount of ingested fat. In some cases chyle escapes directly into the bladder or ureter through a fistulous opening; in other cases the chyle finds its way into the urine within the kidney. In some cases the fluid entering the bladder is true chyle, in others it is lymph."

Fourteen references to published cases are given.

A. G. B.

HERRICK (Alfred B.). **Treatment of Compound Fractures in the Tropics.**—*Proc. Med. Assoc. Isthmian Canal Zone.* 1915. Apr.-Dec. Vol. 8. Pts. 1 & 2. pp. 45–53.

The author writes from an experience of 1,200 fractures treated in Ancon Hospital in 1910–12. Of these 434 were of the long bones, 74 or 17 per cent. being compound. The author writes:—

> "This climate influences the method of treatment. Here, adhesive extension is rather uncertain owing to the increased moisture of the skin. This is so especially in extension of the thigh, where it is necessary to use sufficient weight to counteract the strong thigh muscles. In several cases in the early days, we had all the outer layer of the skin come off with the adhesive a few days after application. Likewise, plaster is uncertain owing to the humidity here. In the dry season we can make use of it, but during the wet season which is the greater part of the year, it is impossible

to foretell whether the plaster cast applied will last more than a few days. I have occasionally seen plaster fail to harden, and frequently to soften in a few days. Thus, two of our most important methods of external immobilization cannot be relied upon in this climate at all times.

"This, of course, has directed our attention more and more to immobilization by internal splinting, and our results in the use of plates for internal splinting have been such as to justify our continued use of them in properly selected cases of compound fractures."

In the operative treatment of compound fractures the author relies on trimming of the soft parts with forceps and scissors, frequently changed, and tincture of iodine; he has given up irrigation. For the interesting details the paper must be consulted. There are no indications of the character of the results.

A. G. B.

QUALLS (Guy L.). **Wassermann Test Survey on Colored Employees, admitted to Surgical Wards, Ancon Hospital. (A Preliminary Report).**—*Proc. Med. Assoc. Isthmian Canal Zone.* 1915. Apr.-Dec. Pts. 1 & 2. pp. 141–144.

This work, it is stated, was undertaken by the surgical staff of Ancon Hospital and Board of Health Laboratory to ascertain, if possible, the percentage of syphilitics admitted to hospital clinically showing no evidence of the disease. The paper is described as a "meager preliminary report." The greater part is given to statistics published by VEDDER.* In a total of 1,456 coloured troops in garrison the test showed 22 per cent. to be positive syphilitics, 13·26 to be probable syphilitics, the total estimated percentage being 35·3. In 531 men of the Porto Rican Regiment the latter figure was 53.

"Vedder further states that this would seem to indicate that possibly syphilis is as important as hookworm infection in the production of the anemias and debilitated conditions said to be so common among the poorer inhabitants of Porto Rico. Several of the double plus cases in his series were diagnosed as anemia without hookworm. The above mentioned investigator states he is inclined to believe that too much importance has been ascribed to the hookworm, especially in the Southern States."

In the author's series the patients were negro surgical patients, natives of the West Indies. The total estimated percentage of infection in 100 showing no physical evidence of the disease was 15; all denied knowledge of infection.

A. G. B.

HERRICK (Alfred B.) & RUNYAN (Raymond W.). **Inguinal Hernia.**—*Proc. Med. Assoc. Isthmian Canal Zone.* 1915. Apr.-Dec. Vol. 8. Pts. 1 & 2. pp. 147–154.

In the two years 1913–14, 391 patients with inguinal hernia were operated on in Ancon Hospital; 56 of these had double hernia. Of the 391, 332 were employees of the Isthmian Canal Commission. It is with these that the paper deals. After remarks on the age and sex incidence the following table is given to show the incidence on the races concerned. The "Europeans" are labourers from Southern Europe, mostly Spaniards.

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* Bulletin No. 8, War Department, June 1915.

Nationality.	Number.	Employees. Rate per 1,000.	
		1913.	1914.
United States	74	8·34	·42
European	87	18·29	13·48
Blacks	171	4·73	2·58

In this series of cases 56 patients had direct hernia, and 17 of these were double. This is a much larger proportion than is met with elsewhere—direct herniae are said to form 3 to 5 per cent. of all cases—and was especially marked in the white employees. Lymph varices were mistaken for hernia several times. They are usually "multilocular cystic tumours extruding along the spermatic cord." "They always occur in negroes and are frequently associated with the enlarged, soft, freely movable inguinal or femoral glands which are characteristic of filariasis." The authors nearly always operate on hernia. In general, they use the Ferguson closure for all oblique herniae and the Bassini in the direct variety. Their technique is described.

Of complications found at the operation hydrocele was noted 16 times, sliding hernia 15, and lymph varix, 9 times. As the population is a shifting one the number of recurrences cannot be accurately determined.

A. G. B.

Treibly (C. E.). **Climatic Bubo.**—*U. S. Nav. Med. Bull.* 1916. Oct. Vol. 10. No. 4. pp. 661–663.

The author, Assistant-Surgeon, U.S. Navy, believes that true climatic bubo is met with only in the Tropics, and that it is a condition *per se* "with no reasonably assignable aetiology." In "about 25 or more cases" there were no organisms demonstrable. No venereal history was obtained except in one instance when the patient admitted gonorrhoea over a year before. "Absence of venerealism" is considered one of the diagnostic points. The only "real treatment" is considered to be excision and enucleation with careful search, when all seem removed, for elusive glands.

A. G. B.

Boucher (H.). **Un cas de tuberculose zoogléique à la Côte d'Ivoire.**—*Bull. Soc. Path. Exot.* 1916. July. Vol. 9. No. 7. pp. 416–419.

The case was that of a negress, aged 35 years, who for seven years had suffered from caries of the left os calcis, as the result of a puncture from the seed of a palm. As an incidental result of the lesion patches of achromasia, of a reddish black hue, appeared in various parts of the body and the patient, as a consequence, believing herself to be leprous, at last sought medical advice.

Upon examination, the patient exhibited loss of flesh, pallor of the mucous membranes, friction sounds at the apices of both lungs, but without cough, and also mitral stenosis. The liver and spleen were both tender to palpation, but not much enlarged. The abdomen was generally tender, resonant in some parts and dull in others, but contained no fluid. The left heel showed five fistulous openings at the junction of the plantar with the dorsal skin, and a scar on the plantar surface. An operation was performed on the calcaneum, by the lifting of a flap of skin, and a sequestrum measuring 3 by 2 centimetres was removed from the inferior aspect of the bone. The granulations and fistulae were then scraped, and the skin replaced with a drain inserted. Eleven days after operation the patient became comatose and died. An autopsy was not performed.

Microscopic examination of the pus obtained from the lesion revealed the presence of a cocco-bacillus, not acid-fast, and clumped in zoogloea-form. Cultures gave the following results:—

Broth.—Uniform turbidity at the end of 24 hours, with a slight pellicle on the following day. This became more marked on the third day, when there appeared a deposit, which gradually augmented in thickness.

Potato.—Clear white colonies, forming on the second day a compact coating. This began to turn yellow on the fourth day and turned to a creamy brown on the eighth. Thickness 2 to 3 mm.

Agar.—Clear white growths, which became abundant at the end of 48 hours. In the water of condensation abundant deposit by the third day, and the layer of growth became yellow by the eighth day.

Agar-gelatine slope.—The same characters.

Agar-gelatine in puncture.—White growth along the puncture in 24 hours. White layer on the surface by the third day.

Neutral-red agar-gelatine. More abundant growth. The lower half of the medium became fluorescent on the third day, and the whole on the eighth.

Sabouraud's glucose-agar.—White prominent colonies, 1 mm. in diameter, resembling those of BRISOU's coccus, slower growth than on simple agar.

Milk.—No alteration.

Broth with the addition of lactose and alkaline carbonate.—No development in the first two days. Gas and turbidity on the third. Deposit at the bottom on the sixth day.

Under the microscope, the pellicle formed on the surface of the broth was shown to be formed of a number of zoogloeal masses, consisting of cocco-bacilli not exceeding 2μ in length. On agar the bacillus attained 5μ in length, along with shorter specimens clubbed at one end. A guinea-pig was inoculated on the inside of the thigh, and five days afterwards there appeared an ulcer, which crusted over and presented at its base numerous zoogloeal masses. The scab fell off in another five days and the sore then commenced to heal.

As far as the author's experiments showed, this bacillus exhibited all the characters of MALASSEZ and VIGNAL's cocco-bacillus, with the exception of the fermentation of lactose. The author adds that he was much troubled by the contamination of his cultures by the ova of certain little insects belonging to the family of Psychodidae, which laid their eggs on the cotton-plugs of the cultivation tubes, and under the edge of the covers of the Petri dishes, being apparently attracted by some odour proceeding from the growths of this particular bacillus.

J. B. Nias.

Mayo (William J.). A Consideration of some of the Maladies in which Splenectomy may be indicated.—*Lancet.* 1916. Nov. 25. pp. 889–892.

One hundred and thirty-five splenectomies have been performed in the author's Clinic, with 12 deaths, a mortality of 8·5 per cent. He classifies the "diseases with which the spleen is concerned" in three groups: (1) splenomegalias of parasitic origin; (2) splenomegalias of probably toxic origin associated with anaemia and cirrhosis of the liver; and (3) splenomegalias associated with blood dyscrasias. These groups are considered in turn. The cases of the first group were splenomegalies of syphilitic and pyogenic origin. The author writes:—

> "To sum up, it may be said that splenectomy is a curative measure in properly selected cases of splenic anaemia, haemolytic jaundice, and allied states, and that it may be curative in certain as yet little understood conditions which are confused with pernicious anaemia, leukaemia, and cirrhosis of the liver. Splenectomy is of value in certain types of parasitic splenomegalia—notably, malaria and syphilis. It is of value for the palliation of some types of pernicious anaemia. In portal and biliary cirrhosis associated with splenomegalia splenectomy may have a field of usefulness, but there has not been sufficient experience with it in these conditions to furnish reliable data. In true leukaemia splenectomy does not appear to have standing, but in connexion with the use of radium it is at least to be considered."

In an earlier part of the paper, with reference to the accuracy of the results obtained by percussion, he states that in the large majority of cases little real knowledge of the physical condition of the spleen will be obtained unless it can be felt by careful palpation on full inspiration with the patient lying on the right side.

A. G. B.

Hallenberger. Beitrag zur Pathologie und pathologischen Anatomie in Kamerun.—*Arch. f. Schiffs- u. Trop.-Hyg.* 1916. Aug. Vol. 20. No. 16. pp. 382–397. With 3 plates.

A form of croupous *pneumonia* which is fairly frequent among the natives in South Cameroon is due, the author says, to a Staphylococcus. He has several times grown *S. albus* in pure culture from the blood of patients as well as from the heart blood and lung exudate of the recently dead. Another form of pneumonia, which is very severe and leads to death with marked icterus in 1–2 days, is attributed to a haemolytic Streptococcus, *S. longus.* This also has been recovered from the blood. At autopsies of the first named form purulent meningitis was frequent.

Two cases are detailed having symptoms suggesting tuberculosis of the lungs but the author attributes the condition to a spirochaete. One was an old Coaster, the other a native. The latter was much emaciated and was sent to hospital as (?) phthisis. He had coughed for some weeks. There was irregular fever and signs of catarrh at the lung apices and superior lobes. The sputa were muco-purulent. Tubercle bacilli were carefully sought but never found, whereas numerous spirochaetes of the *schaudinni* type were constant. The patient was going downhill and the author decided to give an injection of salvarsan (0·3 gm.). His signs promptly cleared up, his cough and spirochaetes disappeared, a week later the injection was repeated and in another week the patient was discharged well and in a good state of nutrition.

The European's case was similar. The salvarsan injection (0·4 gm.) had such an effect that though he could hardly drag himself to the hospital, on the fourth day he went out briskly, quite well. Two months later he said that in his African career he had never been so fit. The author admits that the connection between the condition and the spirochaetes is not proved.

Three cases of *paratyphoid B*, one European and two natives, were diagnosed by culture of the bacilli and by Widal.

In a similar paper by LÖHLEIN [this *Bulletin*, Vol. 2, p. 106] it is concluded that the *pseudo-lepra* described by PLEHN does not exist in Cameroon, these cases being true leprosy in spite of the non-finding of the bacillus. The author agrees with LÖHLEIN. The lesions often take the form of red-brown spots with a somewhat raised, scaly edge; there may be no disturbances of sensation. As a matter of fact lepra bacilli can be easily demonstrated by the antiformin method, the details of which are given. The scales from the edge of the spots are treated with a 15 per cent. solution till they are completely dissolved. Some of these early cases were improved by atoxyl, but the war stopped observation.

Two cases of *goundou* are noted, a disease not previously reported, the author thinks, from Cameroon; they occurred in 8-year old children. Both had the skin lesions of yaws six months before. The Wassermann was positive and injection of salvarsan relieved the pain and brought the process to a standstill. He has no hesitation in naming this disease periostitis ossificans framboesica. [CASTELLANI and CHALMERS call this condition, after BRUMPT, pseudo-goundou and consider that true goundou is a disease *sui generis.*]

A case of *pinta* is figured. An aspergillus was found; the author does not think the condition is very frequent in the colony. Two cases of *elephantiasis* of the labia are figured; such cases are rarely seen though the disease is common in man. A case of elephantiasis of the lower lip also is figured; in the operation the knife grated against several calcified filariae.

A curious kind of tumour was seen in a native who came for treatment for yaws. In the floor of the mouth was a swelling as large as a pigeon's egg coming from the root of the tongue and having several finger-like processes. These are shown, not very clearly, in a photograph. A piece was removed and examined with the resulting diagnosis—Plasmacytoma ? Aetiology. It might have been a manifestation of yaws as the patient believed.

Other diseases described are, leukaemia, amyloid degeneration of liver and spleen in a beriberic patient, and sarcomata. Some of the tumours and their microscopical sections are figured.

A. G. B.

JOJOT (Ch.). **Aperçu médical sur la campagne du Cameroun de 1914-1916.**—*Bull. Soc. Path. Exot.* 1916. Oct. Vol. 9. No. 8. pp. 584-591. With a map.

The author gives an account of the country, its physiography and climate with a map, whereon the direction of the marches of the Allied columns is shown by arrows. His account is based on observations made at the hospital at Duala in 1914-16 and information obtained from medical officers of columns, especially at the time of the final concentration at Duala. The troops consisted almost entirely of natives commanded by Europeans, and porters were more numerous than soldiers. It is noted that wounds on arrival at the base were usually infected by a variety of organisms, especially by the *Bacillus pyocyaneus*. Chronic septicaemia was the most common cause of death among the wounded. Gas gangrene was extremely rare. Antitetanus serum was regularly used, but there were five deaths from tetanus. *Beriberi* raged in the French contingent of the column operating in the maritime zone, exclusively among the natives. It was characterised by difficulty in walking, slight oedema of the lower limbs and cardiac symptoms. Deaths were rare, but most of the patients were evacuated. White Asiatic rice, completely decorticated, was the basis of the diet, but this was the case also in the English contingent, which had only an insignificant number of cases, about 20 against 400 amongst the French. The porters, less well fed, clothed, and housed than the tirailleurs suffered much less than they did. Two sections of a company fed in common, but had different cantonments; only one was attacked. [It is to be hoped that more details will be published of this outbreak.]

Malaria is prevalent all over Cameroon. Natives had rarely to be admitted to hospital, but Europeans suffered considerably; the mortality was almost nil, but many had to be invalided. Malignant tertian parasites were found in 80 per cent. of cases, benign tertian and quartan in 10 per cent. each. Quinine was taken as a prophylactic, 0·25 gm. per day. *Blackwater fever* appeared amongst the Europeans and contributed considerably to their mortality. *Dysentery*, like malaria, raged, but amongst natives as well as Europeans; amongst the British contingent it caused 700 admissions to hospital; it killed a considerable number of native soldiers and porters. In the great majority of cases it was amoebic, but in a few instances it was shown to be bacillary. According to the Germans bacillary dysentery is to amoebic in Cameroon as 3 to 7. Amoebic dysentery was treated with considerable success by injections of emetine. A small number of cases of *typhoid* fever were proved bacteriologically, both in Europeans and natives; typhoid fever had already been reported by the Germans, especially on the plantations. There was a large amount of pneumonia and pneumoccic meningitis amongst the natives.

Trypanosomiasis showed itself in a small number of Europeans and natives, the symptoms being usually enlargement of the cervical glands, trypanides,* fever and deep pain on pressure of the soft parts; several of the areas of operation were dangerous foci of sleeping sickness. Phagedenic ulcer was a veritable plague and many natives had to be invalided. A few Europeans and natives showed *Filaria loa.* Abscesses due to guinea worm were common; the author states that guinea worm was previously unknown in Cameroon and the campaign will have contributed to its dissemination. Many deaths were caused amongst the porters, both British and French, by the privations and exhaustions of the campaign.

A. G. B.

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* This expression signifies skin manifestations; it is formed on the analogy of syphilide.

BERNUCCI (G.). **Della Tripolitania e dello stato sanitario del corpo d'occupazione durante l'anno 1914, con cenni sull' opera degli ambulatori per indigeni, retti da medici militari.** [Report on the Territory of Tripoli and the Occupying Army for the Year 1914, with Notes on the Working of the Native Dispensaries managed by Army Medical Officers.]—*Giorn. Med. Milit.* 1915. June 30. Vol. 63. No. 6. pp. 425–470.

The population of the territory of Tripoli, exclusive of Fezzan, was estimated at 530,000 at the last Turkish census, which was taken in July 1911. Being obtained chiefly for fiscal purposes, this return is probably correct. Nine-tenths of this population resides in the oases of the coast and of the hilly region inland, while the remaining tenth consists of the nomad tribes of the interior. The basis of the population is a Berber stock, crossed extensively with Arab and negro, but found in a state of purity here and there. There are also colonies of pure-blooded Jews, often of a blond type.

The soil of Tripoli is generally sandy with an impervious pan of rock underneath, which holds up the water, thus permitting of the sinking of shallow wells, on which the population depends for its supply. Below this pan there is a cretaceous subsoil. Behind the coast-line there is a table-land, furrowed by water courses and sloping again to the desert towards the south. The highest point of this table-land (Mount Tigrenna) rises only 800 metres above sea-level. The climate of the country is Mediterranean in type, the annual mean temperature for the city of Tripoli being 19·7° C., which is only 2° above the mean for Syracuse in Sicily. The lowest mean, in the month of January, is 12°, while the highest is 26·4° in August. The mean daily range of temperature is 7°. The mean annual rainfall for 20 years, for the city of Tripoli was 420 mm. (16 inches), of which 359 mm. fell between October and February, and 69 between February and October. Naturally the climate is drier than this towards the desert. At Ghadames and other places within the desert zone temperatures up to 50° in the shade have been met with. The humidity is relatively high throughout the year, the mean at Tripoli being 66, which, combined with the high temperature of the summer months, renders the climate trying to Europeans. The precipitation is nowhere great enough to form permanent rivers. One stream alone (the fountain of Sciar-Sciara) flows continuously from the edge of the table-land, but it soon loses itself in the sand, to re-appear again at the surface near the coast. One of the first cares of the new Government has been to sink wells in sufficient numbers everywhere, the water being raised to the surface by gas-engines and wind-mills. In two places only has an artesian supply been obtained, at a depth of 80 metres at one spot and at 240 at another. As might be expected, the water is generally strongly saline from chlorides, sulphates and nitrates, as in Tunisia.

From the foregoing sketch it will be seen that the territory of Tripoli is, on the whole, not unhealthy, and, in Roman times, Northern Africa was generally regarded as a healthy region. The rare occurrence of stagnant surface-water, and the consequent absence of mosquitoes in particular, renders it relatively free from malaria.

With the exception of the city of Tripoli and its suburbs, the sanitary service of the colony is at present entirely controlled by the military authorities, and one of the first things undertaken in this connection was the establishment of a system of dispensaries for natives throughout the territory. At present the number of these medical posts amounts to 21.

The army of occupation in Tripoli had, in 1914, a mean strength of 19,130 Italian troops, who are chiefly distributed in garrisons along the coast, and 8,000 natives, including the gendarmery. The number of Italian soldiers who entered hospital in the year 1914 amounted to 7,972, of which number 4,384 cases were of an ordinary medical type. For the native troops and auxiliaries less reliable statistics alone are forthcoming. The following table gives the number of cases of zymotic disease occurring among the troops.

	Cases.
Malaria	158
Enteric fever	65
Bubonic plague	2
Leprosy (a native)	1
Entero-colitis	65
Undulant fever	2
Venereal diseases (Italians)	1,173
„ „ (natives)	196
Tropical sore (all natives)	359

There were also 354 cases of cutaneous disease among the Italian troops and 24 cases of scurvy in natives. The mortality for the 19,130 Italian troops, during the year, amounted to only 39 = 2 per 1,000, a surprisingly low figure.

The number of attendances at the 21 native dispensaries, during the year, amounted to 156,697, comprising 38,228 cases of ordinary medical disease, 21,563 cases of syphilis, and about 10,000 cases of skin disease. In general the types of disease prevailing among the natives are those of the rest of the North of Africa and require no comment.

J. B. N.

Testi (F.). **Il servizio sanitario militare e le condizioni igienico-sanitarie in Cirenaica dal giugno 1912 ai primi mesi del 1916.** [The Military Sanitary Service and the Sanitary Conditions in Tripoli from June 1912 to the first months of 1916.]—*Giorn. Med. Milit.* 1916. Oct. 31. Vol. 64. No. 10. pp. 737–771.

A report on the sanitary conditions of the new Italian colony of Tripoli for the period 1912–1915. The style of the report is diffuse, and the statistics are not properly tabulated, and in addition most of the information given has been already published in other forms [see, for example, Bernucci's report for 1914, summarized above]. The number of sanitary stations, or dispensaries, instituted for the treatment of the natives and directed by the military medical staff, was in 1916 reduced to 18. The principal diseases coming for treatment to these posts are trachoma and other chronic diseases of the eye, syphilis, tuberculosis, intestinal complaints, ankylostomiasis and chronic sores. Malaria is practically unknown, from the dryness of the climate and the absence of surface water. An outbreak of plague developed at Bengazi in the second half of the year 1913 and was not completely suppressed until the middle of 1915. It would appear from the author's account that the disease was imported from the interior, and kept up by continual arrivals from the same quarter. He observes that the local conditions are against the spread of the disease to any great extent by rats.

J. B. N.

GABBI (Umberto). **Sulla maggiore diffusione geografica di talune malattie esotiche esistenti in Italia e sulla presenza di due nuove di esse: la filariosi e la bilharziosi.** [The Increasing Extension of Certain Tropical Diseases in Italy, and the Presence of Two New Ones, Filariasis and Bilharziasis.]—*Pathologica.* 1916. Oct. 15. Vol. 8. No. 190. pp. 323–325.

A short note reporting a still wider distribution in Italy during the last two years of undulant fever, pappataci fever, leishmaniasis, both visceral and cutaneous, and climatic bubo. To this list must now be added the previously unnoted occurrence of filariasis, both as chyluria and as elephantiasis, and of bilharziasis.

[The separate papers by different observers recording these occurrences have already been noted in the *Bulletin.*]

J. B. N.

UNITED STATES NAVAL MEDICAL BULLETIN. 1916. Oct. Vol. 10. No. 4. pp. 725–766.—**Topographical Extracts from Annual Sanitary Reports.**

Monrovia, Liberia; Freetown, Sierra Leone. [IRVINE (W. L.).] pp. 725–736. With 1 chart.

The Mosquito Coast and the Caymans. [HARGRAVE (W. W.).] pp. 737–741.

La Romano, Santo Domingo; St. Marc and Gonaives, Haiti. [HELM (J. B.).] pp. 741–748.

Tampico and Vera Cruz. [YOUNIE (A. E.).] pp. 751–753.

Progreso, Carmen and Merida, Mexico. [RIORDAN (J. F.).] pp. 754–757.

These extracts, from Reports by Assistant Surgeons of the U.S. Navy, contain much that is of interest about ports situated in little known parts of the world, in addition to well-known ports such as Freetown. The authors appear to have made the best use of their opportunities of getting information but naturally some of it lacks precision. The extracts start with an account of the geographical features of the port in question and go on to consider the climate, medical topography, water supply, drainage and sewerage, food supply, hospitals, health regulations, health conditions, with the diseases prevalent, and disease carriers. Naturally there is little information about some of the ports, where conditions are very primitive. Only a few points of interest can be mentioned here.

Monrovia seems to be untouched by sanitation. Of the population we are told that "it is variously estimated at from 6,000 to 10,000." All water is contaminated, there is no sewerage, no hospital, no definite health laws or regulations. The prevailing diseases are given as malaria and gonorrhoea. The account of Freetown is the most complete and forms a useful compendium of information from the sanitary side. It is stated that *Musca domestica* is practically never seen for the reason that there is no horse manure. [This may be so but the reason is unsatisfactory, for the house fly, or a variety of it, breeds in night soil in India [see, *e.g.*, this *Bulletin*, Vol. 7, p. 399], and even in temperate regions does not restrict itself to horse manure.]

The Grand Cayman Island and its neighbours seem to have the characters, for the tropics, of health resorts. "The islands are exceedingly healthy, as evidenced by the great ages to which some of the inhabitants live."

Before the ship left New Orleans it was fumigated by the Public Health Service, each compartment being subjected to carbon monoxide gas for 35 minutes. Several days after, when at sea, a few rats were seen aboard. It is noted, in explanation, that the engine and boiler room were not fumigated, and that some rats escaped asphyxiation by hiding in bilges or "between the side plates and sheathing."

On the survey grounds off the Mosquito Coast [from the Misskito Indians which inhabit it] "urticaria, tinea cruris, dermatitis resulting from sand-fly bites and staphylococcic infections are very common." Local abscesses appear at some site of friction or irritation, most commonly on the hands or feet. The men were required to wear foot gear at all times during the day and an antiseptic dressing was applied "to all skin injuries regardless of extent." Instances are given to show that cases of respiratory disease pursue a very protracted and insidious course in this climate.

The town of La Romana in Santo Domingo is in cleanliness "much above the average tropical town," but St. Marc and Gonaives in the Haiti portion of the same island seem as filthy as they well can be. In the last named town there is a "very pernicious form of malaria" after the rains; it possesses a piped water supply but there are also wells and cisterns. The state of the market place, slaughterhouse, and jail must be read to be believed. At the ports in Honduras and Guatemala conditions have been improved a little by the medical department of the United Fruit Company.

The following interesting extract comes from the Tampico report:—

> "The *Sacramento* was anchored in the Panuco River off Tampico from December 20th, 1914, to June 23rd, 1915. During this time no regular liberty was allowed owing to unsettled conditions and open hostility shown by the natives. Sanitary conditions in towns were not good. Mosquitoes, both anophelines and culicines, were very numerous and voracious. Quinin in doses of 5 grains was given daily as a prophylaxis, and the ship was thoroughly screened, with the happy result that not a single case of malaria occurred on board during our entire stay of over six months, with the exception of the medical officer, who developed a beautiful case of malignant tertian fever which refused to respond to quinin by the mouth, but cleared under injections of the bimurate. The medical officer was probably the only one who neglected the prophylaxis. During this time malaria of all types was extremely prevalent in Tampico, and on merchant ships and interned ships anchored close by numerous deaths occurred. This experience convinces me of the value of quinin prophylaxis, if given at quarters where the men cannot evade actually taking it regularly, as an adjunct to mosquito protection and mosquito extermination. After leaving Mexican waters quinin was discontinued, and but one case of fever developed, which was easily controlled by quinin. No deleterious effect from the long-continued medication were observed."

The most prevalent diseases in Southern Haiti are stated to be malaria, dengue, and enteritis. Small parties were allowed ashore at three ports. Very little sickness occurred on the ship with the exception of several stubborn cases of climatic bubo. Towards the end of the cruise boils in large numbers appeared. "Both of the above conditions would appear to be due to insufficient fresh vegetables and fruits, together with too long a stay in tropical waters."

A. G. B.

da Matta (Alfredo A.). **Geographia e Topographia Medica de Manáos.** [The Geography and Medical Topography of Manaos (Brazil].—92 pp. With 14 plans. 1916. Manáos: Typ. da Livraria Renaud.

This is a monograph, prepared by the author in his capacity as Head of the Municipal Medical Service, on the physical conditions and public health of the important town of Manaos, on the Upper Amazon. Part I. describes the geographical situation of Manaos, its water supply and the fauna and flora of the region, Part II. the climatology, and Part III. the demography. Part IV. deals with the prophylaxis of malaria, leprosy and tuberculosis, while the appendix contains numerous tables and plans.

A very complete account of the sanitary condition of Manaos has been given by H. Wolferstan Thomas in Vol. 4 of the *Annals of Tropical Medicine and Parasitology* (Liverpool, 1911), and the present monograph brings the statistical information down to the year 1914. From a table in the Appendix (12A) it would appear that the population of Manaos has increased from 36,000 in 1907 to 60,700 in 1914, and the task of overtaking the sanitary difficulties incidental to this rapid increase of population must have been very great. Nevertheless, much would seem to have been done, because the general mortality has fallen from 46 per 1,000 per annum in 1911 to 21·4 per 1,000 in 1914. Infectious diseases (Nos. 1 to 20 in the causes of death in table No. 12) furnished 43·6 per cent. of the total deaths in 1914, or 569 out of 1,305. Malarial fever heads the list and is followed by tuberculosis. Yellow fever, formerly somewhat prevalent, disappeared altogether in 1914. The position of Manaos, however, as a terminus of navigation for vessels proceeding up the Amazon, affords no guarantee against the re-appearance of this evil. Not only are fresh cases of yellow fever imported, but also fresh supplies of mosquitoes, and the low-lying position of the town, on an alluvial soil in the midst of creeks, renders the total extermination of mosquitoes very difficult. Table No. 14 in the appendix exhibits effectively the terrible toll taken by death from pulmonary tuberculosis, 130 deaths occurring in 1914 out of a total mortality of 1,305, or 10 per cent. of the whole. Part of this mortality is due to the landing of sick sailors from ocean-going ships, but the bad architecture of the Portuguese houses, and the abuse of alcohol are also incriminated as causes.

The financial crisis in Brazil has considerably limited the amount of money available for the improvement of Manaos.

J. B. N.

CHAMBERLAIN (Weston P.). **Care of Troops on the Mexican Border. Four Months' Medical Experience with an Army of One Hundred and Fifty Thousand Men.**—*Jl. Amer. Med. Assoc.* 1916. Nov. 25. Vol. 67. No. 22. pp. 1573–1582. With 10 text-figs.

Between May 10th and July 31st, 1916, 110,000 U.S. militia men encamped on the long Mexican frontier line between Brownsville near the mouth of the Rio Grande and Yuma seventeen degrees to the north-west. There were present also about 40,000 regulars. An account is given of the mobilisation of the militia and the defects thus disclosed. Numbers of men had to be discharged for disability; sanitary equipment was inadequate or antiquated; inoculation for typhoid and small-pox had to be rushed. The hospital preparations, etc., are described and various other topics relating to the sanitary care of a large army between 26° and 32° north latitude. A short account is given of the treatment of water-supplies, garbage, and human excreta, and of the combating of flies. There was a remarkable absence of infectious diseases and of deaths from disease, and comparison is made with the statistics in 1898, the last general call on the state troops. Only 121 deaths occurred between June and September; of these 61 were due to disease, of which only 17 were caused by acute infectious diseases. Tables illustrate this and other points. The morbidity was always well below 2 per cent. Between May and October there were 24 cases of typhoid and no deaths; in 1898 among a smaller number of troops the cases were 20,916 and the deaths 2,192 in about eight months.

"The phenomenal improvement which has characterised the present mobilization . . . may be attributed in part to betterment of general sanitary conditions, but much more largely to a specific measure, namely, the compulsory administration of antityphoid vaccine. This is evidenced by the fact that, although typhoid is endemic in this section, there have been but twenty-four cases of this disease among the troops, while there have been very much greater numbers of paratyphoid and dysentery infections, both of which are preventable by the same general sanitary precautions which are efficacious in limiting the spread of typhoid. It is the specific sanitary procedure, anti-typhoid inoculation, which has safeguarded the troops from the ravages of typhoid fever."

A table shows the "antityphoid vaccination status" of those attacked. Between May and October there were 250 cases of paratyphoid diagnosed by blood culture, and doubtless many more occurred. In general they were very mild. All but one were caused by the A bacillus. Most of the cases occurred in the lower Rio Grande valley. Antiparatyphoid inoculation has been begun. There were sporadic cases of dysentery with nine deaths. Both bacillary and amoebic forms occurred in the expeditionary force in Mexico. The weekly report of sick, July–October, shows the cases of malaria, the maximum in one week being 130.

The paper, which is illustrated by views of hospitals, hospital trains, ambulances, etc., is chiefly of military interest.

A. G. B.

MAXWELL (James L.). **The Diseases of China.**—*Jl. Trop. Med. & Hyg.* 1916. Oct. 16. Vol. 19. No. 20. pp. 237–238.

Tuberculosis in all its forms is stated to be rife in China, phthisis being probably the commonest cause of death in the cities of the South.

Syphilis is extremely prevalent and probably more severe than in England; bone affections are certainly more common. Parasyphilitic affections of the nervous system are, however, very rare.

"*Tropical Forms of Disease.*"

Epidemic Infections—Plague is endemic through the southern third of China; the prevalent type is bubonic. "The association of rats with the disease has been so evident that the scourge is known among the Chinese as the rat-plague." *Dengue* periodically invades the South and during the hot months reaches the North. It is of ordinary text-book type. *Undulant fever* is present throughout the southern two-thirds of China. *Enteric fever,* typhoid and paratyphoid, is present everywhere and is often undiagnosed. *Typhus fever* is confined to northern and central China. *Cholera* is extremely widespread, occurring as virulent epidemics.

Endemic Diseases—Leprosy is found throughout China. It is terribly rife in the south, "in places sometimes rising to ½ to 1 per cent. of the population." *Beriberi* is found along the coast and the course of the great rivers.

Protozoal Diseases.—Malaria is ubiquitous and of all varieties. Sub-tertian is endemic in the south. *Blackwater fever* has never been proved to exist in China. [This is interesting because CASTELLANI and CHALMERS include China in their list of blackwater fever localities.] *Kala azar* has of recent years been reported with increasing frequency. COCHRAN has mapped its distribution [see this *Bulletin,* Vol. 3, p. 130 and map]. It is found from Wuchang to Pekin. Children are commonly attacked. *Relapsing fever* is probably widely distributed. *Phlebotomus fever* has been reported from Hong Kong, Pekin and the Yangtse. *Yaws* is imported from time to time from the Straits, but soon dies out.

Metazoal Parasites.—Paragonimus westermani "is only reported from China as single and rare cases." There is an infected locality near Foochow. *Filaria bancrofti* has a wide but irregular distribution along the coasts of South and Central China and the valley of the Yangtse. *Schistosoma japonicum* is extremely present in the valleys of the Yangtse and its tributaries. *Ascaris lumbricoides, Tricocephalus trichiuris* and *Oxyuris vermicularis* are universal. *Strongyloides intestinalis* is widely distributed, but comparatively rare. *Ankylostoma duodenale* and *Necator americanus* "are ubiquitous and the cause of untold invalidism in China." North Chekiang [a maritime province] is the one great endemic centre for *Fasciolopsis buski.* Apart from this the worm has a wide distribution. The writer has found three specimens in the examination of several thousand stools for ankylostome worms. Where it produces disease the symptoms are, diarrhoea ending in dysentery, wasting, anaemia and extreme debility. *Clonorchis sinensis* is common in Canton Province and Hong Kong and in the Yangtse valley. Tape-worm is rare in China.

"*Systemic Disease.*"

Dysentery is common all over China. "Roughly speaking, amoebic dysentery is the disease of North and Central China, while amoebic, bacillary and mixed dysenteries are common in the South." The Chinese are almost, if not quite, exempt from *sprue*. Foreigners get it in the coast ports. *Non-malignant stricture of the rectum* is common, the usual cause being tertiary syphilis. *Tropical abscess of the liver* is more common among the Chinese than among the native populations of other countries. *Tropical febrile splenomegaly* is "beginning to emerge from the maze of malarial and other splenomegalies. It is the disease in South China which at the moment calls most loudly for systematic investigation. . . . Of its etiology we are in total ignorance." *Ulcus tropicum* is relatively common in South and Central China. *Parasitic ringworms* are ubiquitous.

A. G. B.

HETFIELD (W.). **The Upper Yangtze River; Sanitary Notes from U.S.S. "Monocacy."**—*U.S. Nav. Med. Bull.* 1916. Oct. Vol. 10. No. 4 pp. 757–759.

The author, Assistant-Surgeon, U.S. Navy, gives a short account of Chungking, the ship's base, and of the diseases met with there and among the personnel, 45, of the gunboat [*cf.* this *Bulletin*, Vol. 7, p. 318]. Chungking is infested with dogs which devour all faecal matter not used for fertilizing purposes. The extent to which the natives are infected with animal parasites, chiefly ascaris and ankylostomes, is "simply appalling." Both amoebic and bacillary dysentery are very common and typhoid is present at all seasons. The water supply is taken direct from the river in buckets. Tuberculosis is "fearfully prevalent" owing to the damp climate, want of sunshine and indiscriminate expectoration. Venereal diseases abound. The natives get syphilis mildly, and tabes and general paresis are practically never seen. Small-pox, usually mild, is very common. Typhus and relapsing fever are occasionally met with.

On the ship there was a fatal case of typhus, and in February an epidemic of a slight febrile dengue-like malady lasting 2–3 days, to which the whole ship's company succumbed; recovery was prompt and there were no recurrences. There was no vermin on the ship and it was too early for biting flies or mosquitoes.

A. G. B.

ALDEN (A. Maxwell). **The Results of Fifty Autopsies on Children under Ten Years of Age.**—*Proc. Med. Assoc. Isthmian Canal Zone.* 1915. Apr.-Dec. Vol. 8. Pts. 1 & 2. pp.116–119.

The author, who is pathologist to the Santo Tomas Hospital, says that these statistics are preliminary to a larger series. The principal causes of death were: entero-colitis and gastro-enteric intoxication, 16; broncho-pneumonia, 13; ulcerative colitis, 4; tuberculosis, 9; other diseases, 1 or 2 each. Thus the gastro-enteric conditions account for 20, or 40 per cent., broncho-pneumonia for 26 per cent., and tuberculosis 18 per cent. In the more severe types of entero-colitis, where there is a chronic disturbance of metabolism, the liver almost invariably showed a marked increase in fat content. Thirteen of the children were less than two years old, the real cause being some error in diet. An education campaign amongst the mothers will alone save these children.

The broncho-pneumonia is as a rule secondary to bronchitis, measles, colds, etc., and is usually lethal. The tuberculosis figures are compared with those of institutions in New York, with the result that the percentage in this series is considerably higher. Of 13 children with tuberculosis, 10, or 76 per cent. were less than three years of age. At least one lung and the peribronchial lymph glands were found to be tuberculous in every case, pointing to the respiratory tract as the avenue of entrance. In six lung cases there were cavities, indicating " either a very virulent organism or a fertile soil." Tuberculous broncho-pneumonia is the most frequent and characteristic form ; the pleura is almost always affected. We are not told to what race the children belonged.

A. G. B.

CASTELLANI (Aldo). **The Treatment of Certain Diseases of Protozoal Origin by Tartar Emetic, Alone and in Combination.**—*Brit. Med. Jl.* 1916. Oct. 21. pp. 552–553.

The diseases of protozoal origin referred to in the title are, yaws, kala azar and oriental sore, and relapsing fever. In *yaws*, in the author's experience, tartar emetic gives better results when combined with other drugs, especially potassium iodide. He therefore devised his " yaws mixture," containing tartar emetic, salicylate of soda, pot, iod. and sod. bicarb. The sodium salicylate " seems to hasten the disappearance of the thick yellow crusts." The sod. bicarb. decreases the emetic properties of the mixture. At the same time it makes it cloudy but, through the intervention of the Editor of the *British Medical Journal*, successful attempts have been made to obviate this. The result is the modified formula given below –

Tartar emetic	gr. j.
Sod. bicarb.	gr. xv.
Sod. salicyl.	gr. x.
Potass. iodid.	ʒ j.
Glycerine	ʒ ij.
Or syrup	ʒ j.
Or sod. tartarat.	gr. x.
Aquae.	ad ℥ j.

Castellani thinks that glycerine gives the clearest mixture. It is given diluted in water three times daily ; half doses to Europeans.

The author has recently treated four cases of infantile *kala azar* in Corfu. Three cases recovered. They were treated by tartar emetic in intravenous injections (1 per cent. tartar emetic in sterilised normal saline), in intramuscular injections, by the mouth, and by combinations of these methods. The intramuscular method is very convenient in children. To avoid the pain carbolic acid is added according to the following formula :—

" Tartar emetic	gr. viij.
Ac. carbol.	♏ x.
Glycerin	ʒ iij.
Aq. dest.	ad ℥ j.

Half to 1 ccm. every other day in the gluteal regions by intramuscular injection."

The addition of gr. ¼ sod. bicarb. makes the mixture slightly alakline. Martindale's antimonium oxide preparation is considered less good.

The formula for oral administration is as follows :—

Tartar emetic		gr. v.
Sod. bicarb.		gr. xxx.
Glycerin		℥ j.
Aq. chlorof.		℥ j.
Aquae	ad	℥ iij.

(ʒj to ʒij in water t.d.).

In adults the dose can be doubled.

A case of *oriental sore* was rapidly cured by twelve intramuscular injections and the tartar emetic mixture.

Tartar emetic has been used in 17 cases of *relapsing fever* in Macedonia and Corfu, but in this disease it is less effective than salvarsan ; in a large percentage of cases it appears to prevent relapses. Intravenous injections give the best result.

The conclusion is that tartar emetic can be considered a specific in espundia, granuloma inguinale, and leishmaniasis, that it is efficacious in yaws and seems to have a beneficial action also in relapsing fever.

A. G. B.

Low (George C.). **The History of the Use of Intravenous Injections of Tartar Emetic (Antimonium tartaratum) in Tropical Medicine.**—*Trans. Soc. Trop. Med. & Hyg.* 1916. Dec. Vol. 10. No. 2. pp. 37–42.

A brief chronological account of the use of intravenous injections of tartar emetic in trypanosomiasis, leishmaniasis and ulcerating granuloma. [If, as seems fitting, the credit for the discovery of a new use of a well-known drug should go to those who first put it to that use rather than those who threw out the suggestion, credit here is due to Plimmer and Thomson rather than to Nicolle and Mesnil.] The author refers to the case of ulcerating granuloma published by Dr. Newham and himself [this *Bulletin*, Vol. 9, p. 209] and says that he now has a similar case, in which large numbers of injections of antimony have failed to bring about cure. He suggests the use of intravenous antimony in other diseases, especially those due to protozoa, such as malaria [since which a paper by Rogers has been published claiming that it leads to the disappearance of crescents]. Twenty-nine references are given.

A. G. B.

Upendra Nath Brahmachari. **The Preparation of Stable Colloidal Antimony.** [Correspondence].—*Lancet.* 1916. Oct. 21. p. 728.
Stroud (Lewis).—*Ibid.* Oct. 28. p. 768.

Dr. Upendra Nath Brahmachari writes to say that, a stable solution of colloidal antimony for use in protozoal diseases being hard to obtain, he has made experiments first with ethyl alcohol and then with chloroform.

> "The apparatus consists of a fair-sized induction coil worked by an 8-volt accumulator. The electrodes, made of aluminium foil, are dipped in chloroform, into which are added coarse particles of metallic antimony freed from dust of antimony by sifting. On passing sparks through this medium some of the antimony passes into a powdery state and some goes into solution. On distilling off the solvent we obtain a tar-like substance, having a peculiar smell. The substance can be dried in a desiccator or in

air and even heated gently over the Bunsen burner, but apparently does not undergo much change, as it is freely soluble in chloroform after such treatment. . . . The colloid obtained in this way seems to be a very stable substance."

It is this preparation which he uses in kala azar [see this *Bulletin*, Vol. 8, p. 406].

Mr. Stroud, writing from the Crookes Laboratories, refers to the preparation of colloidal antimony, collosol antimony, made by Mr. Henry Crookes in 1912, which is still quite stable. It is chemically prepared, and does not break down in the presence of electrolytes.

A. G. B.

Màrtiri (Adolfo). **L'Istituto Antirabico di Firenze "Pietro Grocco" nel quadriennio 1912–1915.** [Report for the Four Years 1912–1915 of the Pietro Grocco Antirabies Laboratory at Florence.]—*Riv. Crit. Clin. Med.* 1916. Nov. 25. Vol. 17. No. 48. pp. 613–625.

A report for the above laboratory mainly of local interest. The number of cases of suspected rabies treated amounted to 1,231, out of which number there were six deaths. The presence of rabies in the animal causing the lesion was verified by laboratory methods in 565 cases, by clinical observation in 50, and was not verified in 616. The bites were caused by 1,109 dogs, 97 cats, 1 ferret, 1 ass and 23 pigs.

J. B. N.

de Langen (C. D) & Schut (H.). **De Bloedsuiker in de Tropen en haar beteekeniss bij het acclimatiseeren.** [Blood-Sugar in the Tropics and its Relation to Acclimatization.] (With Summary in English).—*Geneesk. Tijdschr.. v. Nederl-Indië.* 1916. Vol. 56. No. 4. pp. 490–515.

By means of Bang's method of estimating sugar in blood, the authors find that, in the tropics, the amount of grape-sugar and other copper-reducing substances in the blood is from 30 to 70 per cent. higher than in temperate climates, both in men and animals. They give the following figures :—

Amount of sugar in 100 mgm. of blood.

	Europe.	Batavia.
Rabbits	0·10 mgm.	0·16 mgm.
Guinea-pigs	0·11 ,,	0·155 ,,
Sheep	0·07 ,,	0·11 ,,
Cocks	0·15 ,,	0·26 ,,
Ricebirds	——	0·31 ,,
Men (white)	0·07 to 0·11 mgm.	0·125 to 0·20 mgm.
Javanese (healthy)	——	0·12 to 0·21 ,,
,, (sick)	——	0·12 to 0·19 ,,
(In a case of diabetes, plus tuberculosis and lues, 0·7 mgm.)		
Chinese (sick)	——	0·13 to 0·20 ,,
(In a case of diabetes 0·315 mgm.).		

It is to be noted that this excess of sugar does not give rise to glycosuria in inhabitants of the tropics, except in the case of excessive amounts (0·3–0·7 mgm.), thus indicating a decreased permeability of the epithelium of the kidney, and it is suggested that the symptoms of debility experienced by Europeans in the process of getting accustomed to a tropical life are, in part at least, ascribable to this retention of sugar. The liability of inhabitants of the tropics to such diseases as accompany diabetes, as for example tuberculosis, may thus also find an explanation. A defective diet, which in temperate climates would not be sufficiently deficient in vitamines to cause beriberi, might also in this way, in the tropics, induce that disease.

By Bang's method, a weighed piece of filter-paper, from 1·5 to 2 centimetres square, is saturated with blood from a prick of the finger, and is then weighed again and dried; or a measured quantity of blood may be drawn up by a pipette and blown out upon the paper so as to obviate the process of weighing. The dried paper is next placed in a test-tube, and 7 cc. of a boiling 20 per cent. solution of potassium chloride in water is poured upon it. This coagulates the blood perfectly, whilst extracting all the sugar, and after standing for from 20 to 30 minutes the solution is poured off; the paper is then again extracted with a further 4 cc. of the same solution in order to dissolve the last traces. The sugar is estimated in the mixed solutions with Bang's solution of copper, or in other ways.

J. B. N.

de Langen (C. D.). **Cholesterine-stofwisseling en rassenpathologie.** [With Abstract in French pp. 35–36]. [The Metabolism of Cholesterin in Race Pathology.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1916. Vol. 56. No. 1. pp. 1–34.

The author summarises his paper in French, from which the following account is taken. He discusses the part played by cholesterin in the human economy, with special regard to the suprarenals, believing that by such researches the problem of biliary lithiasis can be solved. In the last ten years the native population of the Dutch East Indies have suffered from cholelithiasis rarely, though typhoid fever is very common. The author finds that the normal value of cholesterin in Malayan blood is about half the average met with in Europe by Chauffard and others; similar low values were obtained for the bile. The calculi are found chiefly in the large and small bile ducts, rarely in the gall bladder; those which have been examined are formed of bilirubin-calcium, not of cholesterin. In Japan biliary calculi are also rare, and of the same composition as the Malayan. The author wonders whether the slight cholesterin metabolism is due to a diet poor in cholesterin or whether the internal glands function differently according to the race. He notes that in diabetes and other diseases in Europe—rare in the Dutch Indies—there is excess of cholesterin in the blood.

A. G. B.

Concepción (Isabelo) & Bulatao (Emilio). **Blood-Pressure Picture of the Filipinos.**—*Philippine Jl. Sci.* Sec. B. Trop. Med. 1916. May. Vol. 11. No. 3. pp. 135–149. With 2 text-figs.

The only previous observations on Filipinos were made by Musgrave and Sison and by Chamberlain. They discussed only the systolic pressure. The authors point out the importance of the diastolic and pulse pressures. "According to WARFIELD blood-pressure estimation should register three values, namely: the height of the systolic; the height of the diastolic; and the difference between the two, the pulse pressure." The significance of each is then discussed. The readings were made on 697 males and 218 females, a total of 915 cases, convicts in Bilibid prison or persons connected with the College of Medicine and Surgery. The apparatus used was the Erlanger sphygmomanometer. A table and a chart show the averages of the readings from 15-20 and afterwards in decades. "There is a general tendency for the systolic, diastolic, and pulse pressures to ascend with age. . . . In males of 29·5 years and in females of 25·1 years our cases show average systolic pressures of 115·5 and 116 millimeters of mercury, diastolic pressures of 79·1 and 83·4 millimeters, and pulse pressures of 36·4 and 32·6 millimeters respectively." Another table compares the systolic pressure readings obtained with those given by CHAMBERLAIN (Filipinos) and WOLEY (Americans).

> "The systolic pressures of the Filipinos are very much lower than those of the Americans living in temperate climates (Woley, Table II), but the same as those of the Americans living in the tropics (Chamberlain) whose ages range between 18 and 50, the average being 26·6 years. These findings suggest that in the tropics systolic pressures are very much lower than in temperate climates." . . .
>
> "Huggard claims that this low blood pressure found in the tropics is associated with the dilation of the peripheral blood vessels as well as increased elasticity of the vessel walls. Musgrave and Sison believe that it is due, first, to the low peripheral resistance associated with the increased secretory function of the sweat glands and, secondly to the possibility of splanchnic influences associated with prevalent sensation of abdominal vacuity and to the frequency of gastrointestinal disturbances. Chamberlain suggests that there is a vaso-constriction of the superficial blood vessels in the tropics. This will not only explain the occurrence of tropical pallor, but will also account for the fact of its disappearance in a few days on the return of the subject to a cold region."

As to pulse rate HUGGARD and CHAMBERLAIN maintain that the pulse rate in the tropics is increased by ten beats a minute. CHAMBERLAIN found an average of 79·1. The authors' figures were 81·5 for males and 84·1 for females; they thus agree with CHAMBERLAIN. These and other results are given in the authors' summary.

A. G. B.

GAUDUCHEAU (A.). **Mélange colorant pour remplacer le Giemsa.**—*Bull. Soc. Med. Chirurg. Indo-Chine.* 1916. Sept. 10. Vol. 7. No. 8. 5 pp.

The author, writing from the bacteriological laboratory at Hanoi, describes a stain which he has devised to replace the now unobtainable Giemsa. The composition of his mixture, which is at once a stain and a fixative, is as follows:—

Absolute ethyl alcohol or alcohol at 95°	7 parts.
Water soluble eosin, 0·5% in absolute alcohol	1·5 „
Methylene blue, 1% in absolute alcohol	1·5 „
Borrel blue	0·5 „

The Borrel blue is prepared after TRIBONDEAU's method.* The slides are placed face upwards in Petri capsules or other receptacles.

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* *C. R. Soc. Biol.* 1916. Apr. p. 282.

A known quantity of the mixture is poured over, so as to cover the smears, and after 4–5 minutes four times as much water is added and carefully mixed; the preparations are then left for 25 minutes if the stain is fresh, 10 minutes if it is old (a week or more). Wash with water for ½–1 minute and dry with blotting paper. The results obtained with blood are as those with Giemsa. It may be necessary to change the relative quantities of each stain, as specimens vary in their activity; the author has used Grübler's stains. Avoid precipitation by not letting the water act too long. The stain does very well for smears from stools, showing up spirilla and spirochaetes clearly. The cost is small.

A. G. B.

TRIBONDEAU (L.). **Etalement du sang sur lames de verre porte-objets par le "procédé des ciseaux."**—*C. R. Soc. Biol.* 1916. Nov. 18. Vol. 78. No. 18. pp. 1011–1012.

The "scissors method" of making blood smears seem worth description; experience alone will show whether it is superior to other methods, as the author believes.

The blades of the scissors and the slide are first carefully cleaned with alcohol and dried. The blades are separated or opened at a right angle. Take the handle of one blade in the left hand so that the blade points forwards, its cutting edge turned to the left, the plane surface looking upwards and slightly to the right. With the right hand hold the slide by one end between the thumb and index. Touch the exuding drop of blood with the slide close to the index. Hold the slide horizontally with the drop below and rest it at its middle across the cutting edge of the blade. Then push the slide from right to left till the blade touches the drop, move it lightly from side to side till the drop spreads between the slide and blade, and then draw it slowly from left to right so as to spread the blood over the left two-thirds of the slide. Slide and blade must be always in contact and keep their respective orientation. Dry the smear in air. Clean the scissors with cold water and then alcohol. Any instrument with a straight cutting edge serves.

It is claimed that in these smears malarial parasites are not deformed.

A. G. B.

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GOODRICH (H. P.). On Certain Parasites of the Mouth in Cases of Pyorrhoea (Preliminary Communication).—*Jl. Roy. Microscop. Soc.*, 1916.

MALINS SMITH (A.) & MATTHEWS (J. R.). The Intestinal Protozoa of Non-Dysenteric Cases.—*Ann. Trop. Med. & Parasit.*, 1917.

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Note.—On direct application (not through agents or booksellers) any of the foregoing reprints or pamphlets will be sent on loan to any part of the world, the Bureau paying outward postage.

Journal (other than exchange) received.

LA NIPIOLOGIA, 1916. Dec. 31. Vol. 2. No. 4. Napoli: Via P. S. Mancini, 13.

Book received.

LELEAN (P. S.) [C.B., F.R.C.S., F.C.S., D.P.H., R.A.M.C.] Sanitation in War. With an Introduction by Surgeon-General Sir Alfred KEOGH [K.C.B., M.D., F.R.C.P.]—viii+336 pp. F.C. 8vo. With 54 Illustrations. 2nd Edit. 1917. London: J. & A. Churchill. [Price 6*s*. net.]

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[Continued from BULLETIN, Vol. 8, pp. xxxiii-lvii.]

For the benefit of recipients of the Bulletin, who wish to make a **Card Catalogue**, or to preserve a consecutive record of the references on any subject, **galley proofs** ['*Korrekturbogen*'; '*Première*'] of the **Quarterly Lists of References** (printed on one side of the page) can be supplied at the subscription price of **Two Shillings** per annum. They are obtainable from the beginning of 1914 onwards. Application should be made direct to the Bureau.

AMOEBIASIS (including Liver Abscess).

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[The same paper, with a few more details, as that which appeared in the *Lancet*, Aug., 1916—already noticed.]

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[This is the report that appeared in the *Brit. Med. Jl.*, Sept , 1916—already noticed.]

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[A detailed account of the histo-pathology of mucocutaneous leishmaniasis, containing nothing very novel. The photographs of sections are not as effective as many that have already been published.]

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[A resumé of the present day treatment of visceral leishmaniasis by antimonial preparations, CARONIA'S organic compound being specially singled out for notice (this *Bulletin*, Vol. 8, p. 7) The writer does not contribute any experience of his own.]

HECKENROTH (F.). Deux nouveaux cas de Leishmaniose canine à Dakar. —*Bull. Soc. Path Exot.*, 1916. Nov. Vol. 9. No. 9. pp. 696–697.

[Two cases of leishmaniasis were found among 126 dogs examined. All the animals were either European or crosses between European and native dogs.]

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[This paper is a continuation of the author's previous work (see this *Bulletin*, Vol. 8, p. 479). The chief new feature is that he considers that typhus is a disease of the bloodvessels, in fact, a desquamative endarteritis.]

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TOEPFER (H.). Der Fleckfiebererreger in der Laus.—*Deut. Med. Woch.*, 1916. Oct. 12. Vol. 42. No. 41. pp. 1251–1254.

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[An address on the lines indicated by the title, which is interesting from the attention which it draws to the labours of Dutch workers in the subject, notably Eijkmann, Stokvis, and Hubrecht.]

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[The stone in question, in a Barbadian, weighed 195 gms. cf. this *Bulletin*, Vol. 6, p. 424, for statistics of lithiasis in negroes in the Canal Zone.]

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Figueiredo (Antonio Gonçalves). Ligeira contribuição para o estudo do parasitismo intestinal no extremo norte do Brasil.—*Arch. Brasileiros de Med.*, 1916. Apr. Vol. 6. No. 4. pp. 218–226.

☛ [The author gives details of four cases of intestinal parasitism in which were found *Entamoeba coli*, *Ancylostoma duodenale* eggs and Koch's bacillus. Accompanying these was an undetermined Protozoon, apparently a Ciliate, which may cause entero-colitis.]

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Greggio (Rd. P.). Le novarsénobenzol et quelques affections au Congo belge.—*Bull. Soc. Path. Exot.*, 1916. Dec. Vol. 9. No. 10. pp. 760–761. With 1 plate.

[This drug has been used by the writer at Kisanti in the Middle Congo region in some 500 native cases, mostly yaws, in the last three years. One tribe maintains that the disease was wilfully brought to them in food by another. The native method of treatment by actual cautery is described. The plates show patients before and after treatment.]

Grijns (G.). Beknopt verslag van de werkzaamheden in het Geneeskundig Laboratorium gedurende het jaar 1915.—*Geneesk. Tijdschr. v. Nederl.-Indie.*, 1916. Vol. 56. No. 6. pp. 779–788.

[At the Medical Laboratory of Weltevreden, during the year 1915, two courses of instruction in tropical diseases were given to medical practitioners, while 415 cases of disease were sent in for diagnosis in addition to 599 cases of skin diseases.]

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MÀRTIRI (Adolfo). L'Istituto Antirabico di Firenze "Pietro Grocco" nel quadriennio, 1912–1915.—*Riv. Crit. Clin. Med.*, 1916. Nov. 25. Vol. 17. No. 48. pp. 613–625.

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[A paper from Paramaribo, Dutch Guiana. Many medicinal plants are mentioned but the popular names only are given.]

QUALLS (Guy L.). Wassermann Test Survey on Colored Employees, admitted to Surgical Wards, Ancon Hospital. (A Preliminary Report).—*Proc. Med. Assoc. Isthmian Canal Zone.* Apr. to Dec., 1915. Vol. 8. Pts 1 & 2. pp. 141–144.

REINHARD (P.). Die radiologische Untersuchung tropischer Lebererkrankungen.—*Arch. f. Schiffs. u. Trop.-Hyg.*, 1916. Oct. Vol 20. No. 20. pp. 455–466.

ROUBAUD (E.). Les Porcins et la conservation des Ectoparasites humains, dans les régions chaudes.—*Bull. Soc. Path. Exot.* Dec. Vol. 9. No. 10. pp. 768–771.

RUDLER. Enquete sur l'alcolisme dans la population scolaire indigène de l'Algérie.—*Bull. Soc. Path. Exot.*, 1916. Dec. Vol. 9. No. 10. pp. 773–777.

Samuels (W. F.). General Paralysis of the Insane in Federated Malay States.—*Indian Med. Gaz.*, 1916. Dec. Vol. 51. No. 12. pp. 453–455.

[Most of this paper is included in one summarised in this *Bulletin*, Vol. 9, p. 93. In four years 44 cases of G. P. I. were admitted to an asylum in the F. M. S. All were Chinese.]

Santangelo (Belisario). Anemia splenica infantile con linfocitema a decorso febbrile e ad etiologia ignorata.—*Malaria e Malat. d. Paesi Caldi.*, 1916. Sept.-Dec. Vol. 7. No. 5–6. pp. 292–301.

Schachner (August). Some South American Travel Notes.—*New York Med. Jl.*, 1916. Dec. 23. Vol. 104. No. 26. Whole No. 1986. pp. 1231–1234. With 6 text-figs.

[A paper of small medical interest. This statement is found: "Cases of leishmaniasis, a protozoal disease named after Major Leishman, of the English Army, and representing a form of trypanosomiasis, is said to be a common condition among the South American Indians."]

Sicard (J. A.), **Rimbaud** (L.) & **Roger** (H.). Paralysies graves du nerf sciatique consécutives à des injections fessières de quinine.—*Paris Méd.*, 1917. Jan. 6. Vol. 7. No. 1. pp. 10–13. With 1 text fig.

Telang (R. H.). Quinoidine. [Correspondence.]—*Indian Med. Gaz.*, 1916. Dec. Vol. 51. No. 12. pp. 474–475.

Tribondeau (L.). Etalement du sang sur lames de verre porte-objets par le procédé des ciseaux.—*C. R. Soc. Biol.*, 1916. Nov. 18. Vol. 79. No. 18. pp. 1011 1012.

Wender (Louis). The Role of Syphilis in the Insane Negro.—*New York Med. Jl.*, 1916. Dec. 30. Vol. 104. No. 27. Whole No. 1987. pp. 1286–1292.

Williams (R. B.). A Brief Report of the Activities of the Field Hospital, First Brigade, United States Marine Corps, Port au Prince, Haiti, September 4, 1915 to September 20, 1916.—*U.S. Nav. Med. Bull.*, 1917. Jan. Vol. 11. No. 1. pp. 107–114.

Entomological.

Dunn (Lawrence H.). *Hermetia illucens* breeding in a Human Cadaver.—*Proc. Med. Assoc. Isthmian Canal Zone.* Apr. to Dec., 1915. Vol. 8. Pts. 1 & 2. pp. 129–131.

[Reprinted from *Entomol. News.* 1916. Feb. Vol. 17. No. 2. pl. 59.]

Edwards (F. W.). Ten New African Haematopota.—*Bull. Entomol. Res.*, 1916. Oct. Vol. 7. Pt. 2. pp. 145–159, With 1 plate and 10 text figs.

[The species described come from Nyasaland, S. Nigeria, British East Africa, Uganda, Gold Coast, Sierra Leone, and the Congo.]

González Rincones (R.). Presentación de dos anofelinos capturados en Aragua por el doctor Núñez Tovar.—*Gaceta Med. de Caracas*, 1916. Nov. 30. Vol. 23. No. 22. pp. 171–172.

Langeron (M.). Remarques sur l'évolution larvaire de *Theobaldia annulata* (Schrank, 1776).—*Bull. Soc. Path. Exot.*, 1916. Nov. Vol. 9. No. 9. pp. 704–708. With 10 figs.

Macfie (J. W. Scott) & **Ingram** (A.). The Domestic Mosquitos of Accra.—*Bull. Entomol. Res.*, 1916. Oct. Vol. 7. Pt. 2. pp. 161–178. With 2 maps.

Public Health Reports, 1916. Nov. 17. Vol. 31. No. 46. p. 3159. Mosquitoes. An Unusual Breeding Place.

Roubaud (E.) & Van Saceghem (R.). Observations sur quelques insectes et acariens parasites du bétail au Congo Belge.—*Bull. Soc. Path. Exot.*, 1916. Dec. Vol. 9. No. 10. pp. 763–767.

[An interesting observation from this paper is that piggeries between Bomba and Zambi abounded in *Ornithodorus moubata.*]

Schroeder (Hermann). Anopheles und Betriebsunfall.—*Arch. f. Schiffs. u. Trop.-Hyg.*, 1916. Oct. Vol. 20. No. 19. p. 445.

Swellengrebel (N. H.). Quelques remarques sur la façon de combattre le pou des vêtements.—*Arch. Néerlandaises des Sci. Exactes et Naturelles*, 1916. Ser. 3 B. Vol. 3. pp. 1–31. With 1 plate.

Veiga (Octavio). Prophylaxia da mosca. Methodo biochimico.—*Ann. Paulis. Med. e. Cirurg.*, 1916. Nov. Vol. 7. No. 5. Year 4. pp. 113–117.

Werner (H.). Beobachtungen über Anophelenvorkommen in der Nähe menschlicher Fäkalien.—*Arch. f. Schiffs. u. Trop.-Hyg.*, 1916. Oct. Vol. 20. No. 19. pp. 444–445.

Protozoology (excluding Amoebae, Leishmania and Trypanosomes).

Ascanio Rodriguez (J. B.). Notas sobre la Fauna Parasitaria de los Brachycera.—*Gaceta Med. de Caracas*, 1916. Sept. 15. Vol. 23. No. 17. pp. 131–134. With 1 plate.

[The author endeavoured to determine the causal agent of an epidemic of dysentery at Barranquilla, Colombia, S. America. Amoebae were not found and the disease was refractory to emetine. Thinking that flies (Brachycera) might be concerned in the transmission of the malady, an examination was made of them. Some embryos of *Filaria demarquayi* were found in the flies. In 4 per cent. of the insects Herpetomonads were found. A detailed description is given of the flagellate, post-flagellate and division stages of the Herpetomonas. The body length of the flagellate form was 15μ to 25μ. Some very thin flagellates were observed.]

Bayon (H.). The Development of Pathogenic Properties in Protozoa, with Special Reference to the Herpetomonad Group.—*Trans. Soc. Trop. Med. & Hyg.*, 1916. Dec. Vol. 10. No. 2. pp. 23–32.

de Blieck (L.). Piroplasmen onderzoek in Nederland en zijne Kolonien.—*Tijdschr. v. Diergeneesk*, 1916. Vol. 43. pp. 149–174. [*Index Medicus.*]

de Bliek. Studiën over piroplasmosen in Europa en in Indië.—*Nederl. Tijdschr. v. Geneesk*, 1916. Vol. 2. p. 439. [*Index Medicus.*]

Carini (A.) & Migliano (L.). Sobre um toxoplasma da cobaya. (*Toxoplasma caviae*).—*Ann. Paulistas Med. e Cirurg.*, 1916. May. Vol. 6. Year 4. No. 5. pp. 113–114.

Flu (P. C.). Enkele beschouwingen over parasitische protozoën uit den darm van den mensch.—*Geneesk. Tijdschr. v. Nederl. Ind'ë.*, 1916. Vol. 56. No. 5. pp. 672–696.

Hiatt (Houston B.). Craigiasis.—*Southern Med. Jl.*, 1916. Nov. Vol. 9. No. 11. pp. 979–982.

[Consists mainly of copious extracts from Craig and Barlow, especially the latter. (See this *Bulletin*, Vol. 6, pp. 467–9). Following this there is a short account of two cases observed by the author. One of the patients contracted the infection through drinking well water.]

Kuebitz (H.). Ein Fall von Pferde-Piroplasmose in Bulgarien.—*Arch. f. Schiffs- u. Trop.-Hyg.*, 1916. July. Vol. 20. No. 14. pp. 336–337. With 1 chart.

Léger (L.) & **Hesse** (E.). Sur la structure de la spore des Microsporidies.—*C. R. Soc. Biol.*, 1916. Dec. 2. Vol. 79. No. 19. pp. 1049–1053. With 5 text figs.

[The authors have studied the internal structure of the spores of several Microsporidia, taking that of the piscine parasite, *Pleistophora macrospora*, as the type. They consider that the sporoplasm or "germ" is posterior and does not form a girdle-like ring as Stempell (1904) described. The polar filament is spirally coiled against the sporocyst or spore wall. The polar capsule is relatively large. Special methods of fixation and staining were used.]

Lynch (Kenneth M.). Dauercystformation of *Trichomonas intestinalis*.—*Jl. Parasit.*, 1916. Sept. Vol. 3. No. 1. pp. 28–33. With 9 text figs.

Macfie (J. W. S.). A Flagellate frequenting the Necks of Bottles.—*Jl. Trop. Med. & Hyg.*, 1917. Jan. 1. Vol. 20. No. 1. pp. 1–3. With 12 text figs.

Markoff (Wladimir N.). Piroplasmose und andere blutparasitäre Krankheiten der Haustiere am Balkan.—*Arch. f. Schiffs- u. Trop.-Hyg.*, 1916. July. Vol. 20. No. 14. pp. 313–335. With 5 charts.

Sangiorgi (G.) & **Ugdulena** (G.). Reperto di un flagellato (*Prowazekia* n. sp.) nell' intestino umana.—*Giorn. d. R. Accad. Med. di Torino*, 1916. Jan.–Feb. Vol. 79. No. 1–2. pp. 169–176.

APPLIED HYGIENE IN THE TROPICS.

Bowles (James Ten Broeck). A Study of the Prevalence of *B. coli* in Some Tropical Surface Waters, with Special Reference to Surface Waters of Panama and Some Waters of Mexico.—*Amer. Jl. Pub. Health*, 1916. Nov. Vol. 6. No. 11. pp. 1173–1178.

Heiser (Victor G.). Hygiene and Sanitation on Ocean Vessels.—*Military Surgeon*, 1916. Nov. Vol. 39. No. 5. pp. 455–460.

Galaine (C.) & **Houlbert** (C.). Sur le selfdiffuser à anhydride sulfureux pour la désinfectation et la dératisation des tranchées des cales de navires et des locaux habités.—*C. R. Acad. Sci.*, 1916. Mar. 6. Vol. 162. No. 10. pp. 363–365.

Huntemueller. Wasserversorgung und Kanalisation im alten und heutigen Jerusalem.—*Zeitschr. f. Hyg. u. Infektionskr.*, 1916. Vol. 81. pp. 257–274. With 6 figs.

Long (J. D.). Sanitation in the Philippine Islands. Work of the Sanitary Commissions.—*Public Health Rep.*, 1916. Oct. 27. Vol. 31. No. 43. pp. 2963–2971.

McDonald (W. M.). Suggestions for the Institution of Rural Anti-Mosquito Measures in Antigua.—*Jl. Trop. Med. & Hyg.*, 1916. Nov. 15. Vol. 19. No. 22. pp. 261–262.

Simpson (W. J.). The Need of an Organized Application of Tropical Hygiene to prevent Excessive Wastage from Disease in our Armies in the East.—*Jl. Trop. Med. & Hyg.*, 1916. Dec. 1. Vol. 19. No. 23. pp. 273–277.

Testi (Francesco). Il servizio sanitario militare e le condizioni igienico-sanitarie in Cirenaica dal giugnio 1912 ai primi mesi del 1916.—*Giorn. Med. Milit.*, 1916. Oct. 31. Vol. 64. No. 10. pp. 737–771.

Zalesky (W. J.). Sanitary Notes from the U.S.S.Saratoga.—*U.S. Nav. Med. Bull.*, 1917. Jan. Vol. 11. No. 1. pp. 125–128.

***See also under* Disease Headings.**

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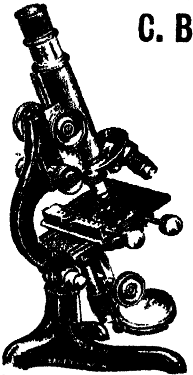

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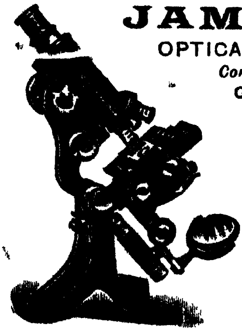

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A—Immunisation is certain. *B*—This method is without risks.
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Rhéantine is the Entero-vaccino-therapeutic method in regard to Gonococcic Treatment. Messrs. Lumière and Chevrotier had since 1913 been undertaking a fresh series of experimental and clinical researches with reference to this subject. After considerable difficulties in their endeavour to find a suitable medium for the cultivation of Neisser's diplococcus, they discovered one based on the wort of beer, which perfectly answered to their requirements, and succeeded in preparing desiccated cultures, in vacuo, forming a perfectly anhydrous and stable vaccinal powder, containing about 500 millions bacilli per milligramme This is administered in keratinised spherules. The clinical effects of Rhéantine on gonorrhoea in its various stages and in the complications of the disease are rapid, well marked and of the most encouraging character.

From a paper read before the Therapeutical Society of Paris (14 ***June***, 1916) –

. . . "Under the microscope these successive changes are demonstrated in equally definite stages whatever may have been the duration of the disease, the characteristics of the pus become rapidly modified; after two or three days' treatment the gonococcus, first intracellular, becomes exterior, it ceases to act as a parasite on the polynuclear leucocytes and the large epithelial cells—one then finds them disseminated outside the leucocytes

"Finally, some days later, if the administration of Rhéantine is continued, the condition undergoes still further change, the gonococci become agglutinated, arranged in a mass, and finally bacteriolysed."

These clinical and bacteriological observations constitute irrefutable proof of the efficacy of anti-gonococcic bacterio-therapy by the gastro-intestinal tract.

The clinical reports of various doctors or noted by ourselves, show that antigonococcic bacteriotherapeutics are capable of giving highly satisfactory results, both in acute and chronic forms of urethral gonorrhoea and also in the various infectious complications due to Neisser's bacillus.

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TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 9.] 1917. [No. 6.

HELMINTHIASIS.

MAYER (Martin). **Ueber die Verbreitung von *Clonorchis sinensis* und anderer Helminthen unter chinesischen Schiffsmannschaften.** [The Distribution of *C. sinensis* and other Helminths in Chinese Crews.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1916. May. Vol. 20. No. 9. pp. 209–215.

Early in 1915 the author noticed numerous Clonorchis eggs in the faeces of three Chinese from ships lying at Hamburg. A systematic examination was made on 260 Chinese seamen by the Telemann method and in each case three large cover glass preparations were searched. Trichocephalus occurred in 173, i.e., 66·5 per cent, Ankylostomes in 76, i.e., 29·02 per cent., Clonorchis in 109, i.e., 41·9 per cent. (7 per cent. of these were heavily infected) and Ascaris in only 2, i.e., 0·7 per cent.

A detailed tabular statement is also given showing the part of China from which each person originated and the incidence in each case of Ankylostoma, Clonorchis and Trichocephalus. Infections, to such a high percentage, with Clonorchis have only been reported hitherto from the Delta region of Tonkin. FISCHER had found only 8 out of 128 Chinese with this parasite at Shanghai. In the present record 203 individuals from Canton showed 99 or 48·7 per cent. infected, while of 30 from Shanghai only 5, i.e., 16·7 per cent. and of 27 from Fuchow only 5, i.e., 18·5 per cent. were positive. Out of 226 persons 203 were between the ages of 20 and 40; between 20 and 30 the infection was 39 per cent.; between 30 and 40 it was 50 per cent., while 10 out of 17, i.e., 58·8 per cent. of cases were between 40 and 50 and 3 out of 6 cases (50 per cent.) were between 10 and 20 years of age.

The infections produced no clinical symptoms. In one case of an old Chinaman in whom eggs had been seen seven worms were recovered from the bile ducts. Of these five when preserved were found to measure 2·2, 2·1, 2·0, 1·8, 1·7 mm. [? 22, 21, 20, 18, 17] in length, while the breadth varied between 3 and 4 mm.

[It may be stated that a number of Chinamen from ships in the Albert Dock, E., with clonorchis-like eggs in the stools were found to harbour *Heterophyes* in large numbers. The eggs are very similar. The above statistics may therefore require revision.]

R. T. Leiper.

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GUNN (Herbert). ***Clonorchis sinensis* in Orientals arriving in the United States.**—*Jl. Amer. Med. Assoc.* 1916. Dec. 16. Vol. 67. No. 25. pp. 1835–1836.

An examination of the stools of 604 Chinese arriving at San Francisco showed that 125, i.e., over 20 per cent. were infected with *Clonorchis sinensis.* The majority of these who were immigrants had been treated with thymol for hookworms en route. Of 82 sick Chinese who were residents of California 24 or 29 per cent. also harboured the infection. Several had been in the country continuously for from four to six years. Four out of 32 (i.e., 12 per cent.) sick Japanese residents were infected but had only been in the United States for a short time. Surgeon-General BLUE considers that the introduction of *Clonorchis sinensis* into the United States should be guarded against.

R. T. L.

TREADGOLD (C. H.). **A Note on the Eggs of the Liver Fluke,** *Clonorchis sinensis*, var. *minor* (Verdun and Bruyant), 1908.—*Trans. Soc. Trop. Med. & Hyg.* 1916. Dec. Vol. 10. No. 2. pp. 33–35.

Eggs of this trematode were found in the stools of an Australian who had visited different parts of China. The smallest egg measured 20·8μ by 13μ and the largest 29μ by 16μ. The marked range is commented on by the author. In most of the cases the operculum and the constriction described as existing towards the anterior end were seldom well defined. Although it is known that experimental infections have followed upon the feeding of different freshwater fish to cats, rabbits and guinea-pigs, the author thinks that other sources of infection may exist and " in the absence of proof to the contrary we must admit the possibility of encysted cercariae being ingested with imperfectly washed salad, grown in water contaminated by the excreta of infected orientals."

R. T. L.

NAKAGAWA (K.). [*Paragonimus westermannii*, **Endemiological and Clinical Notes on Infections by.**]—*Tai Wan Igaku Kai Zasshi*, 1916. May 28. Nos. 150, 151. pp. 256–301. (Abstract based upon Review by R. G. MILLS, in *China Med. Jl.* 1916. Nov. Vol. 30. No. 6. p. 465.)

Paragonimiasis is much more common in northern than in southern Formosa. Chinese and native Formosans are more heavily infected than Japanese. First attacks are fairly evenly distributed throughout the year. The opium habit is probably a direct result and occurs in over 11 per cent. of the patients. X-rays and radium treatments have proved without success. Vegetables, uncooked fish, unboiled water and shell fish are said to enter largely into the diet of the classes to which those infected chiefly belong.

R. T. L.

de LAVERGNE (P.). **Un cas de distomatose hépatique.**—*C. R. Soc. Biol.* 1916. Dec. 16. Vol. 79. No. 20. pp. 1098–1099.

Hepatic distomiasis is uncommon in man in Europe. The author reports a case due to *Fasciola hepatica* in a French soldier, a native of St. Gaudens (Pyrenees), who was recently invalided for febrile exhaustion (*courbature fébrile*). The diagnosis was made from an examination of the faeces. The eggs measure 130μ + 8μ, and are uniformly ovoid, brownish in colour. The infection seems to be the cause of dysenteric symptoms and general ill health, which have lasted about seven years. In the discussion on this paper Professor MESNIL mentions that he had recently seen the eggs of a still rarer fluke, viz., the *Dicrocoelium lanceatum*, in the stools of a Belgian officer who had spent a considerable time in the Congo, at Katanga, and latterly in German East Africa.

R. T. L.

CLAPIER. **Les bilharzioses dans la Région militaire de la Guinée**—*Bull. Soc. Path. Exot.* 1916. Nov. Vol. 9. No. 9. pp. 739–747.

As a member of the Franco-Liberian Boundary Commission (1914–1916) the author had unique opportunities to investigate the incidence of bilharziasis in the French Military Zone of Guinea; that is the territory on the frontier of Liberia between Sierra Leone on the west and the Ivory Coast on the east which forms the watershed of the Upper Niger and the rivers which transverse the Grain Coast.

Investigations were made chiefly on urinary bilharziasis. It is noted however that intestinal infections occurred in eleven out of 154 children between the ages of about five and fifteen. In ten of these the eggs were lateral-spined; in a single case they were terminal. This incidence of infection is considered to be lower than would have resulted from a more careful and detailed microscopical examination as the eggs of *Schistosoma mansoni* are commonly very rare in the stools in intestinal bilharziasis. No cases of diarrhoea or dysentery due to Bilharzia were met with. The stools were soft or formed. In the Kissien country 257 individuals, chiefly boys between 5 and 15 years of age, were examined. Diagnosis had often to be based, however, on clinical information only. Of these 37 were accepted as positive. In the Toma country more careful investigation of children showed 64 positive cases, as determined by centrifugation, out of 108, i.e., 59·1 per cent. In several other villages the urine of 147 adults was also investigated with the help of the centrifuge. Sixty cases of bilharziasis were discovered. Whereas in the Toma country bilharziasis occurred in every second child, in the adult male the incidence diminished towards old age, while in the female it became increasingly prevalent. This is due to the domestic duties of women. They not only wash calabashes and household articles but carry water and devote considerable time to fishing. The men on the other hand work chiefly in the fields which are not irrigated as in Egypt. Quantitative examination of the blood was made in ten cases and the findings are tabulated [but the value of these is doubtful as ankylostomes were present in all of the cases].

R. T. L.

ROBERTSON (A. Roche). **Case Reports from the Army Medical Services. I.—Bilharzias.**—*Canadian Med. Assoc. Jl.* 1916. Oct. Vol. 6. No. 10. pp. 913–914. With 1 fig.

This is a brief clinical note of a case of urinary Bilharziasis in a private in the Royal Canadian Regiment. The chief point worthy of note is that the disease was not contracted during the present War, as might be inferred. The patient was in South Africa with the Third Manchester Regiment for four years being stationed at Middelburg, Cape Colony, for three years and afterwards at Middelburg, Transvaal. He left South Africa in December 1910.

R. T. L.

TRAVERSA (G.) & MACCOTTA (L.). **Il primo caso di Bilarziosi in Sicilia importatovi dalla Cirenaica.**—*Malaria e Malat. d. Paesi Caldi.* 1916. Sept.-Dec. Vol. 7. Nos. 5–6. pp. 317–322. With 4 text figs.

The case is an Italian soldier, who had returned to Sicily from Cyrenaica, and had suffered for three years from urinary bilharzia contracted there. Blood examination showed 95 per cent haemoglobin, 4,800,000 red cells, 6,500 white cells and 2 per cent eosinophiles. The eggs were those of *S. haematobium.*

R. T. L.

LANING (R. H.). **Schistosomiasis on the Yangtze River, with Report of Cases.**—*U.S. Naval. Med. Bull.* 1914. Jan. Vol. 8. No. 1. pp. 16–36. With 17 figs.

It is not an uncommon thing for the gunboats of the various nationalities which patrol the Yangtze to come into port with a fair proportion of their crews completely disabled with schistosomiasis. Those who go in search of snipe appear to be especially liable to infection. Typical cases are said to have three characteristic stages: The initial stage "marked by a high afternoon temperature lasting from three to six weeks, a comparatively slow pulse rate, evanescent oedemas and urticarias, pains in the abdomen, generally in the upper part, cough with evanescent areas of pulmonary dulness, diarrhoea or constipation, marked eosinophilia, and often mental depression." The second stage is associated with "enlarged liver and spleen, with a heavy feeling in the upper abdomen, marked eosinophilia and some anaemia, loss of weight, slight degree of fever at some particular time of day, passage of blood-streaked mucus containing the ova in the stools, more or less tenesmus and straining at stool, sometimes diarrhoea or constipation."

The third or terminal stage may not supervene. It occurs after three to five years and especially if frequent re-infection takes place. It is marked by "cirrhotic liver, sometimes enlarged, sometimes shrunken, ascites, oedematous extremities, marked emaciation, anaemia, weakness, passage of blood and mucus in the stools" and sometimes there is a little fever. The patient may die of exhaustion or some terminal infection.

Laning adopts HOUGHTON'S suggestion that the urticarial Yangtze fever described by LAMBERT in 1910 is due to Schistosoma infection.

On the Yangtze river the most fruitful sources of infection appear to be Wuhu, Gnanking, Hankow and the Tungting Lake.

Clinical details are given of seven cases which occurred upon the U.S.S. "Quiros." It is almost certain that the infection was acquired during a stay at Yochow or Changsha on the Tungting Lake. The incubation period is apparently 24 to 48 hours. The first stage as observed in these cases was as follows :—

"The temperature is normal or but slightly raised in the mornings. It commences to rise about noon and reaches its height, which is seldom above 102° F., about 6 in the evening, from thence gradually falling to normal, its decrudescence being accompanied usually with sweating. The presence or absence of the rash has no effect on the temperature, which may continue for days after all signs of the former have disappeared.

"The pulse rate, taken as a whole, is comparatively slow, and in some cases is below normal, even when there is fever present. In an average case it may be expected to be from 60 to 70 in the morning and from 75 to 85 at night. There is nothing special to be noted as to its volume or regularity; it does not become dicrotic, but if abnormally slow may intermit.

"The effect of the disease on the respiratory passages is most important, particularly important from the point of view of diagnosis, as the symptoms referable to these parts may be assigned to other causes, such as tuberlosis, pneumonia, pleurisy with effusion, or empyema.

"The urticarial rash frequently appears on the mucous membrane of the buccal cavity, also on that of the nose, in the latter position causing temporary impediment to respiration through the nostril, the blockage passing off to the accompaniment of a profuse discharge of watery fluid. The larynx may also show the transient edema, but never, so far as is known, to a dangerous extent, the slight embarrassment to respiration caused by the swollen mucosa soon passing off. So far as the lungs themselves are concerned, the principal symptom is cough accompanied by more or less secretion. This may be distressing to the patient, coming on in paroxysms at irregular intervals and heralded by tightness in the chest, but it is the physical signs which trouble the practitioner. Perhaps on his first examination he finds dullness over one or other base and hears a fine crepitant râle, which makes him think of pneumonia. Possibly the rash has not yet made its appearance and the patient does not seem ill enough for an incipient pneumonia, so he is put to bed and the diagnosis left in abeyance for the present.

"The following day the rash may be out, and the patch of dullness in the lungs may have quite disappeared, the air entering freely. The attendant, glad that he has not committed himself, begins to hedge and directs his attention to the alimentary tract. If, as is possible, there is anorexia or diarrhea and vomiting, he thinks he may say 'ptomaine poisoning,' and probably does so. After a day or two, the patient in the meantime having been treated *secundem artem*, attention is again directed to the respiratory tract by a return of or, if it were never entirely absent, by an increase in the cough. Further examination of the chest reveals a new area of dullness involving, perhaps, the whole of one lung; the breath sounds are distant and fine crepitations again heard. The respiratory rate is not, however, increased to the extent to which one would expect from the physical signs. A day or two more is allowed to elapse before another change in diagnosis is made, when, to the surprise of the examiner, he finds, in listening to the chest, that the lung, which the evening previously was apparently out of commission, is now admitting air freely, while the opposite organ is in the same condition from which its mate has emerged, though a few hours before it appeared to be healthy. And so it will go on from day to day, in spite of the treatment, to the wearying of the patient and the driving of the doctor to despair.

"In some cases the symptoms are distinctly more gastric and intestinal than pulmonary. All types suffer from anorexia and furred tongue and in most of the gastric forms examination of the lungs will show areas of dullness and some amount of cough will be present, but diarrhoea and vomiting are more marked in some cases than in others, while some may require treatment for constipation.

"A steadily increasing eosinophilia is encountered from the commencement. It reaches a high degree, in one case to 40 per cent. (One of my own cases had an eosinophilia of 85 per cent.) The eosinophilia gradually disappears as normal health is regained. There is always a certain amount of anaemia present, which increases if the case is a prolonged one; it is not uncommon to find the red cells reduced to 3,500,000 after three weeks of fever. At first there is a leucocytosis, but later, even with the eosinophilia, the leucocytes may be reduced to 6,000 or 4,000, the brunt of the decrease falling on the polymorphonuclears. The urine is of the usual febrile variety, diminished in quantity, with high specific gravity and increased urates. There was no albumen present in the samples from our cases. In several cases the spleen was found to be palpable. The liver in one case was said to be colored.

" The duration of cases of this type of fever varies considerably. In the milder sort the fever has disappeared at the end of a week or 10 days, the patient regaining his health at the end of a month. In all cases convalescence is comparatively protracted and in the severer types in which the fever lasts from three weeks to a month, restitution to complete health may be delayed for two or three months after the fever has disappeared. In those cases the temperature about the end of the second or third week begins to fall by lysis, the morning temperature being sometimes below normal. Frequently when the temperature has reached as low as 99° the evening it will remain at that level for days at a time."

Treatment consists in keeping in bed on a liquid diet for the first few days until the primary gastric disturbance has passed; then a moderately light diet with aperitives. The second stage requires tonics, rest and change of climate; the third stage should be dealt with as for cirrhosis of the liver from any other cause.

[With regard to the association of urticaria and fever with schistosome infection reference should be made to the annotations on papers by MIYAGAWA and by EDGAR in this *Bulletin*, Vol. 2, p. 177-9, in which it is maintained that these do not coincide in geographical distribution, etc.]

R. T. L.

MANN (William L.). **Some Practical Aspects of Schistosomiasis as found in the Orient. Preliminary Report.**—*Jl. Amer. Med. Assoc.* 1916. Nov. 4. Vol. 67. No. 19. pp. 1366–1368. With 2 charts.

Immediately on joining the United States ship "Helena" at Ichang in China the author had to deal with fourteen peculiar cases

" in which symptoms developed varying from acute bronchitis and urticarial dermatitis to dementia praecox associated with Jacksonian epilepsy and hemiplegia. It was two weeks later, on arrival at Hankow, China, that continued laboratory examinations and further study of the literature convinced me that my cases with tentative diagnoses of cerebral syphilis, sunstroke, hepatic abscess, acute phthisis, etc., might have the same etiologic agent, namely, *Schistosoma japonica.* All cases occurred among forty-two men who had been on a three days' landing party to the gorges above Ichang, and had been bathing in subsidiary streams."

LANING'S classification of the symptoms of the disease is followed by the author. The first stage is the so-called urticarial or Yangtze fever. In 14 cases urticaria, subcutaneous oedema and elevated temperature appeared from twenty-four to seventy-two hours after exposure to infected water.

" In eight out of ten cases there was diarrhea, and in seven this was accompanied by cramps; four of the eight were troubled with nausea and vomiting. There was pain and tenderness over the liver in one third of the patients, and half of them were troubled with cough, expectoration, and other symptoms of pulmonary affections. In one case the pulmonary symptoms were so well marked as to suggest incipient pneumonia. This was the only case presenting the evanescent areas of pulmonary dulness described by other writers. Eight out of the ten cases had elevated temperature varying from 100° to 104° F.; in 75 per cent. there were urticarial wheals and subcutaneous edema, varying from two or three per patient, to cases in which the face was so swollen that the features were scarcely recognizable."

The second stage is that following the fall of temperature and continues to the establishment of convalescence unless the third stage supervenes with the passage of eggs. A minor number of parasites are suspected to cause the various subjective and objective symptoms of this stage such as " transient cough and expectoration, diarrhea and temporary abdominal pain and tenderness, hepatic disturbances, anemia, attacks of pyrexial conditions," and lassitude and slight debility. The diagnosis is often obscure.

In the third stage dyspeptic symptoms are pronounced associated with dysentery and diarrhoea, hepatic and splenic hypertrophy followed by shrinking of the liver, cachexia, emaciation, ascites and finally general anasarca. This stage is comparatively rare in foreigners.

Clinical details of six cases are given. Salvarsan is said to have been beneficial " in the second stage." The author suspects that a small percentage of cases suffering from tropical neurasthenia in China are really obscure " secondary stage " cases of schistosomiasis.

R. T. L.

OGATA (S.). **Ueber den anatomischen Körperbau der Cercarien des *Schistosomum japonicum* und die Uebertragungsweise derselben auf Tiere.** [The Morphology of *S. japonicum* Cercariae and the Mode of their Transmission to Animals.]—*Verhandl. der Japan. Pathol. Gesell., Tokyo.* 1914. Vol. 48.

The anterior portion of the cercaria is barrel-shaped, tapering towards the anterior end. The mouth is guarded by short lancet-shaped bristles and is enclosed in a stout musculature. There is a blind sack, probably the beginnings of a gut. A smaller roundish ventral sucker lies at the posterior sixth of the body. The hinder part of the cercarial body contains three pairs of poison glands; from each a duct passes forwards to discharge into the mouth. The excretory organs are two paired laterally symmetrical flame cells with vessels. In the middle line of the body and in front of the ventral sucker is an oval light brownish structure from which a small canal passes forwards. The tail is somewhat larger than the body and is split into two in its last third. Two flame cells are symmetrically located near the base of the tail. The cercaria passed through the skin in experimental animals. Then by the blood stream they pass to the lungs.

R. T. L.

GONZALEZ (Martinez I.). **Investigations on the Prevalence and Clinical Features of Intestinal Bilharziosis (Schistosomiasis Mansoni) in Porto Rico.**—*New Orleans Med. & Surg. Jl.* 1916. Nov. Vol. 69. No. 5. pp. 352–394. With 8 figs.

Intestinal bilharziasis is a disease naturalized many years since in the Antilles and other regions of the American Continent. Evidence of its occurrence among natives was first brought forward by the author in 1904. Previous papers on bilharziasis in America all refer to cases of bilharzial haematuria due to *Schistosoma haematobium*. The author is of opinion that *S. mansoni* was undoubtedly introduced to America by West African negroes. He is convinced on epidemiological grounds that it is a distinct species. In over 300,000 persons examined by the Anaemia Commission of Porto Rico and by the staff of the Institute of Tropical Medicine and Hygiene not one case of bilharzial haematuria has been discovered.

Manson's intestinal bilharziasis has no predilection for age, sex or race. In Porto Rico it has spread around the entire coast of the Island and prevails in the zones where sugar-cane is cultivated and in the valleys crossed by large rivers At Utuado the endemic index is 2·16 per cent., while at Mayaguez with its extensive bottom lands and numerous swamps it is 8·4 per cent. Although in the majority of cases it is probable that the parasite enters through the skin it is undeniable that certain subjects could only have become infected through the alimentary canal. The clinical features of intestinal bilharziasis in Porto Rico are:—(1) a slight infection in 44 per cent. without symptoms; (2) pseudodysenteric forms in 40·9 per cent. This is chronic from the beginning with frequent attacks of colic accompanied by mucus or mucosanguinolent stools, generally 4 to 6 but at times 12 to 15 a day. Tenesmus is moderate, associated with sensation of weight in the rectum and accompanied by pruritus and piles. (3) Enterocolitic forms in 14·5 per cent. of the cases. This is characterised by absence of diarrhoea with constipation of moderate intensity. The stools are hard and coprine and are enclosed in mucus occasionally sanguinolent. There is moderate intestinal colic, and slight pains in the hepatic or epigastric region are frequent. The appetite is good and general health hardly suffers. Even in the most serious form there is only slight anaemia. Regeneration of blood resulting in a haemoglobin of 99 per cent. to 100 per cent. was noted. There is moderate leucocytosis, eosinophilia and mononucleosis. In benign infections a spontaneous cure occurs in never less than ten years after the subjects have left the endemic centres.

The author's two series of cases total 356. Of these 136 are from Mayaguez in 1904–5 and 220 from Utuado in 1913. Thirty-two occurred under age ten, 127 between ten and nineteen, 119 between twenty and twenty-nine years, 43 between age thirty and thirty-nine, and 31 over forty years, while 4 were unclassified.

R. T. L.

RISQUEZ (Jesús Rafael). **Nota sobre la invasión de los ganglios linfáticos por los huevos del** *Schistosoma mansoni*. [On the Infection of Lymphatic Glands by the Ova of *Schistosoma mansoni*.]—*Gaceta Med. de Caracas.* 1916. Sept. 15. Vol. 23. No. 17. pp. 135–136.

The author states that in sections of the abdominal glands from four fatal cases of bilharziasis which came to an autopsy, he was able to find in every section (0·01 mm. thick) about 50 ova of *Schistosoma mansoni*, making a total of several thousands for every gland infected.

J. B. Nias.

LUTZ (Adolpho). **Observações sobre a evolucão do *Schistosomum mansoni.* Nota previa.** [Observations on the Development of *Schistosomum mansoni.* Preliminary Note.]—*Brazil Medico.* 1916. Dec. 2. Vol. 30. No. 49. pp. 385–387.

On receiving LEIPER's report of his Bilharzia mission to Egypt, the author commenced the study of the infection of Brazilian molluscs by *S. mansoni.* Of five species of Planorbis experimented with, *P. olivaceus* Spix proved the most suitable. The miracidia penetrate by preference the bases of the antennae and cause, within the space of three or four days,the development of tumours which diminish in size and fade away again after the lapse of about three weeks. The tumours consist of spherical masses of round cells possessing a relatively large nucleus, which elongate after a few days and become sporocysts. About the beginning of the third week they show spontaneous movements and migrate to the visceral cavity, where they take on the form of cercariae. The author confirms LEIPER's account of the process. The evolution of *S. mansoni* depends very much on the warmth of the season, and is much impeded by a low winter temperature. *Planorbis ferrugineus* Spix, and *P. tenagrophilus* d'Orb., can also be infected, but the process of development in these species comes to an end prematurely.

A fuller account is promised for the *Memorias do Instituto Oswaldo Cruz.*

J. B. N.

STEWART (F. H.). **On the Life-History of** *Ascaris lumbricoides.*—*Brit. Med. Jl.* 1916. Dec. 2. pp. 753–754.

In earlier papers [this *Bulletin,* Vol. 8, pp. 197 and 515] it was shown that when the eggs of *Ascaris lumbricoides* containing developed embryos are administered experimentally to rats and mice they hatch in the alimentary canal. By the eighth day the larval ascaris reach the mouth via the liver and lungs. Further experiments are now recorded which show that the larvae persist in the lungs and trachea of mice on the ninth, tenth, eleventh and twelfth days after infection and migrate down the alimentary canal on these days. The worms traverse the stomach and small intestine with some rapidity and accumulate in the caecum and large intestine. A large number are voided in the faeces. These experiments lead the author to supersede his former statements that " no larvae were found in the respiratory tract later than the eighth day after infection " and that " it is probable that they emigrate in the saliva of the rodent on to food substances such as bread." Details are given of five new experiments on mice. The Ascaris larvae were measured on the 8th, 9th, 10th, 11th and 12th day. The worms vary between 1 mm. and 2·1 mm. in length.

R. T. L.

MCGLANNAN (Alexius). **Intussusception in Acute Intestinal Obstruction, with Report of a Case occurring with Round Worms.**—*Southern Med. Jl.* 1916. Nov. Vol. 9. No. 11. pp. 977–979.

In two out of 23 cases of intestinal obstruction worms were considered to be the etiological factor inducing the invagination. One case is reported. The patient was a white girl, aged four, who was suffering from severe anaemia, was admitted to hospital on 9th December, 1912, and was found to be infected with round worms. For this, santonin, calomel and magnesium sulphate were given at intervals. On January 20th, 1913 there was an attack of vomiting with slight colic. Santonin and salts were again administered. The bowels moved but the pain and vomiting returned on the following day. There was now epigastric distension. The leucocytes were 18,000. Enemas were ineffectual but later a high enema proved effectual. As the symptoms had not been relieved, there being a localised distension just above the umbilicus an operation, for acute intestinal obstruction was performed. Two intussusceptions were discovered, both were easily reduced and in each was a round worm. One was situated in the terminal portion of the ileum, the other high up in the jejunum. As the worms could not be moved along the bowel by manipulation on account of the spastic contraction of the intestinal wall, the bowel was opened and the worms were withdrawn. No others were seen or felt. The child did not rally.

R. T. L.

BILLINGS (W. C.) & HICKEY (J. P.). **Some Points about Hookworm Disease, its Diagnosis and Treatment.**—*Jl. Amer. Med. Assoc.* 1916. Dec. 23. Vol. 67. No. 26. pp. 1908–1912. With 4 text figs.

From observations made for a period of over three years upon Orientals at the United States Immigrant Hospital, Angel Island, California, the authors are convinced that routine microscopical examination for hookworm eggs is essential wherever a diagnosis in an Oriental is not apparent or is at all doubtful. Out of 6,428 stools of Oriental aliens 3,320 contained eggs of either *A. duodenale* or *Necator americanus.* As hookworm disease was found to be present in a large proportion of Chinese merchants who had visited China for a year after residence in the United States of from fifteen to forty years and who had not been engaged in agricultural pursuits nor had gone barefooted during their visit, it is considered that hookworm infection is contracted by "unconscious coprophagy" due to the eating of raw vegetables, to a much greater extent than has been commonly supposed. This view is supported by the occurrence of hookworm in bound-footed Chinese women who have never gone barefooted even in their own homes. A rather common and unnoted symptom of infection in Orientals is a condition similar to an arcus senilis even in young persons. A simple method for routine use of the centrifuge is given.

"1. Take a piece of (preferably) formed stool, approximately the size of a walnut, place it in a porcelain cup, and after adding about 60 cc. of *cold* water, thoroughly break up the mass with the aid of a wooden tongue depressor. When the suspension is as complete as possible, destroy the tongue depressor.

"If the stool is liquid, add an equal bulk of cold water and mix as directed above.

"2. After placing over the mouth of the cup two or three layers of wide mesh surgical gauze, strain a portion of the contents of the cup into a centrifuge tube and centrifuge for ten seconds at full speed (which means 2,000 revolutions a minute).

"The gauze is thrown away and a new piece used for the next specimen. The cup is emptied of its remaining contents and thoroughly scalded.

"3. Remove the tube from the centrifuge, and without disturbing the sediment, pour off the supernatant liquid and refill with cold water to about three-fourths the capacity of the tube.

"4. Place a thoroughly clean rubber pad over the mouth of the tube, hold in place by the thumb, and shake vigorously. When preparing two tubes at the same time, extreme care will be necessary that the rubber pads are used on their respective tubes at each shaking.

"5. Again centrifuge for ten seconds at full speed.

"6. Pour off supernatant fluid as described above, and refill with cold water. Again shake.

"7. Centrifuge for ten seconds at full speed.

"8. Pour off supernatant fluid, leaving about one-half inch overlying the undisturbed sediment. The specimen is now ready for microscopic examination."

Differential diagnoses of hookworm ova and those of Ascaris, Schistosoma and *Strongylus subtilis* are given. The eggs are illustrated by good photographs. For treatment oil of chenopodium has been used exclusively during the past year. It is more efficient than thymol and dietetic precautions are unnecessary. Where idiosyncrasy is exhibited, free purgation and stimulation with hot coffee is recommended. It has been found preferable to administer the chenopodium oil on sugar than to give it in capsules, emulsion or in tablet form. Chloroform is a marked synergistic when given afterwards with castor oil; 2 cc. are as efficacious as 3 cc. and give no untoward symptoms.

R. T. L.

SPEAR (R.). **Hookworm Infection in Cuba.**—*U.S. Nav. Med. Bull.* 1917. Jan. Vol. 11. No. 1. pp. 50-53. With 10 plates.

At the dispensary of the United States Naval Station, Guantanamo Bay, in Cuba, 2,206 specimens of faeces were examined between April 1914 and August 1916. These were collected from inhabitants of the eastern end of Cuba. Many cases came from the region of Baracoa on the northern coast, while a few were derived from Camaguey in the centre of the island. The various species of parasites were present in the stools in the following percentages:

Hookworms	51%
Whipworms	52%
Roundworms..	20%
Strongyloides	15%

Cuba is losing, from hookworm infection, the services of many who might be working. The infection is so widespread that it is remarkable that all are not infected. The monetary value of the actual loss in labour reaches millions of dollars annually. Prosperous sugar-cane growers and successful business men were victims as well as poor Cubans. Cuban doctors rarely suspect hookworm or examine for it. Many instances seen by consulting physicians were labelled malaria, anemia, liver disease, etc. Cases of severe malaria and of incipient tuberculosis rarely recovered if there was a coexisting hookworm infection that had been overlooked. Two cases of asthma and one of violent Sydenham's chorea were cured by a course of thymol. In advanced cases fatty degeneration of the heart and kidneys may occur with all the accompanying symptoms. The anaemia often results in puffiness under the eyelids. The hair lacks lustre and looks dry.

Epigastric distress and tenderness with acid eructations, general weakness and mental lethargy are among the most constant symptoms. It was noticed that "people infected with hookworms almost always stumbled when they walked over a board placed on the floor." Knee jerks were less than normal. The blood pressure was low, in some cases under 80 mgm. of mercury. Thymol and oil of chenopodium were used, the latter in capsules of 16 minims, three doses being administered, one hour apart and followed by castor oil. If the patient came from a distance and the stools could not be re-examined, thymol and chenopodium were prescribed for alternate weeks and continued for a period of from four to six weeks. The text is illustrated with 50 photos, which indicate the extremes of classes and age, of robustness and emaciation, and the multiplicity of types that are met in Cuba.

R. T. L.

JUERSS (Fritz). **Ueber die Behandlung der Ankylostomiasis mit Oleum Chenopodii.** [Treatment of Ankylostomiasis by Oleum Chenopodii.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1916. May. Vol. 20. No. 9. pp. 215–216.

The examination of the Indian crews of two vessels showed that ankylostome infections were present. In one ship 37 out of 50, i.e., 74 per cent., in the other 2 out of 23, i.e., 8·7 per cent. were infected. Oil of chenopodium was administered by Schüffner and Verwort's method, i.e., 16 drops were given three times at two hourly intervals and finally, after two hours more, castor oil and chloroform. The ankylostomes and ascarids were evacuated, but in later examination of the faeces Trichocephalus eggs were found.

The dose of 3 gm. of chloroform produced a stage of marked excitement in the Lascars. This effect was not induced by 2 gm. doses administered to a Chinese patient from another ship.

R. T. .

FAMULARI (Sebastiano). **La distribuzione geografica dell' Anchilostomiasi nella provincia di Messina.**—*Malaria e Malat. d. Paesi Caldi.* 1916. Sept.-Dec. Vol. 7. Nos. 5–6. pp. 305–309. With 2 maps.

An inquiry into the incidence of ankylostomiasis in the hamlets of the districts of Messina, Castroreale, Palti and Mistretta gave a total of 283 cases. Of these 239 occurred in the district of Messina, the highest number in a single village being 20 at Gesso. A map is appended to the article and shows by special markings the relative incidence of the disease.

R. T. L.

ELDERS (C.). **Over oesophagostomiasis.** [On Oesophagostomiasis.]—*Nederl. Tijdschr. v. Geneesk.* 1916. No. 5. pp. 440–442.

A paper read before the Nederl. Vereeniging voor Tropische Geneeskunde at their meeting on January 30th, 1916. The author exhibited a specimen of the colon of a gibbon which had died from perforation of the intestine, after suffering from dysentery for nine days. The perforation was due to the rupture of a cyst containing worms of the species *Oesophagostomum brumpti.* Their ova were found in the stools. Some worms were free in the peritoneal cavity.

J. B. N.

da SILVA (Ribeiro). **Hyperemése determinada por tricocephalose.** [Hyperemesis caused by Trichocephaliasis.]—*Brazil Medico.* 1916. Oct. 7. Vol. 30. No. 41. p. 323.

The case of a girl, 9 years old, who suffered for more than two months from vomiting which came on about an hour after taking food. It was surmised that there was a functional stenosis of the pylorus. Medical treatment of every kind having proved ineffective, a microscopic examination was made of the stools, which revealed the presence of a large number of ova of Trichocephalus. The administration of thymol caused the expulsion of large masses of adult Trichocephalus, and with their expulsion, the vomiting ceased. The author remarks that, in general, it is the larger worms which cause this rebellious vomiting, and he mentions the case of a lady whose stomach rejected everything for four consecutive days, until the symptoms terminated by the vomiting of four large Ascarides.

J. B. N.

YAMADA (M.) & YAMAMOTO (T.). [*Filaria bancrofti*, **Possible Reason for the Appearance of the Larvae in the Peripheral Circulation at Night.**]—*Tokyo Igak Kwai Zasshi.* 1916. Apr. 20. Vol. 30. No. 8. pp. 465–473. (Abstract based upon Review by R. G. MILLS, in *China Med. Jl.* 1916. Nov. Vol. 30. No. 6. p. 463.)

To ascertain whether the presence of microfilaria in the lungs during the daytime could be ascribed to a condition of chemotaxis for oxygen or carbon dioxide gas, the authors made a series of experiments introducing into sealed tubes of blood of a filarial patient atmospheres of air, pure oxygen and carbon dioxide. The embryos in the tube of oxygen ceased movement in 80 hours while those in carbon dioxide atmosphere only became quiescent after 180 hours. Investigations are in progress to determine whether the condition of the peripheral blood at night coincides with these findings.

R. T. L.

BROHIER (S. L.). **Notes on a Fatal Case of Enteritis, probably of Filarial Origin.**—*Report of the Accra Laboratory.* 1915. pp. 27–29. London: J. & A. Churchill.

In the great majority of cases the presence of microfilariae is unassociated with pathological lesions. The author however records a peculiar case in which unusual post-mortem lesions in the bowel are attributed to the embryos of *Filaria bancrofti.* The patient was an inmate of the Accra Lunatic Asylum. On October 13th 1915 he was taken ill with diarrhoea, several pale liquid stools, without evident mucus or blood, being passed during the day. The disease was associated with marked wasting and anorexia. All efforts to check the diarrhoea were unavailing and death occurred on the fifth day of illness. A post-mortem revealed the following points of special note:—

> "There was congestion of the mucous membrane of practically the entire length of the small intestine, but it was in the lower part of the ileum, for a distance of 1½ feet above the ileo-caecal valve, that the most marked changes were noted. Here the mucous membrane presented a very striking appearance, due to a number of small submucous haemorrhages, varying in size from one-eighth to a little over a quarter of an inch in diameter. These haemorrhages occupied the spaces between the adjacent valvulae conniventes, the valves themselves being free from haemorrhages and appearing to project from a bloody base. The free edges of the valves were covered with a delicate slate-coloured slough of necrosed tissue. This slough was, however, fairly firmly adherent to the subjacent tissue of the valve, and, whilst the most superficial portion came away when a knife-blade was gently passed over it, the greater part still remained attached, presenting an irregular, minute-papillomatous and worm-eaten appearance. On firmer pressure being exerted these minute projections came away, leaving small haemorrhagic points on the free edge of the valve. . . . Smears from scrapings of the bowel showed fairly numerous microfilariae, varying from four to six in each film. Unfortunately I had no opportunity of examining these in the fresh state, as the specimen of the bowel was removed to the laboratory for examination, wrapped in a piece of cloth wrung out in a five per cent. solution of formalin, and consequently by the time they were examined the microfilariae were dead. Sections of the bowel also showed microfilariae in the dilated lymphatic spaces, together with congestion and round-celled infiltration of the mucosa and submucosa, which was most marked in those regions where microfilariae were found."

R. T. L.

von HERRENSCHWAND (Fritz). **Zwei Fälle von subretinalem Zystizerkus.** [Two Cases of Subretinal Cysticercus.]—*Wien. Klin. Woch.* 1916. Oct. 19. Vol. 29. No. 42. pp. 1332–1333.

Intra-ocular cysticercus is exceedingly rare. Von GRAEFE recorded 90 cases out of 80,000 patients with eye diseases. HIRSCHBERG had in Berlin five in one thousand. SATTLER in Leipsic saw only two in 90,000 cases. During the last sixteen years none were met with at the eye clinic, Innsbruck, among 80,000 patients. Lately within a very short period the author had to deal with two cases, both in soldiers. Ophthalmic details and the operative procedure are given. It is stated in each report that the patient was also infected with *Taenia saginata.* [? *T. solium.*]

R. T. L.

WILLETS (David G.). **A Statistical Study of Intestinal Helminthiasis.**—*Southern Med. Jl.* 1917. Jan. Vol. 10. No. 1. pp. 42–49.

The occurrence of endemic helminth infections in institutions is a matter of considerable interest. The author gives a series of analytical tables compiled from records made by him at the Georgia State Sanitarium during 1908 and 1909. These tables show the relative frequency, severity, age and sex distribution of infections with Ascaris, Trichocephalus, Strongyloides, Ankylostomes and Hymenolepis. A comparison of his findings with those of STILES and GARRISON is set out thus :—

TABLE III.

Comparison of Findings at the U.S. Government and Connecticut Hospitals with those at the Georgia Sanitarium.

Parasites.	Government and Connecticut Hospitals.		Georgia Sanitarium.	
	Number.	Per cent.	Number.	Per cent.
Trichiuris	266	7·69	293	23·94
Oxyuris	45	1·30	0	0·00
Hookworm	36	1·04	228	18·63
Ascaris	17	0·49	202	16·50
Hymenolepis	12	0·35	6	0·49
Strongyloides	8	0·23	129	10·54
Taenia	2	0·06	0	0·00

The most noteworthy find is the high percentage of infection with Strongyloides. In one case the infection was very intense. No less than 189 embryos were counted in a single microscopical field. The conditions at the Sanitarium appear to have been favourable for the propagation of Strongyloides and the whipworm and unfavourable for the ankylostome and Hymenolepis. This is illustrated by the figures given on following page.

It is anticipated that a systematic campaign against helminthiasis in institutions like that under consideration would prove that intestinal parasites have an appreciable effect upon the mortality and morbidity of the insane.

R. T. L.

van LIERE (Edward J.). **The Intestinal Parasites of Twenty Foreign Students in the University of Wisconsin.**—*Jl. Amer. Med. Assoc.* 1916. Nov. 4. Vol. 67. No. 19. p. 1369.

Ten out of twenty foreign students showed eggs of helminths in the faeces. Of these six had Trichocephalus while the seventh had *Hymenolepis nana*, the eighth *Ascaris lumbricoides*, the ninth *Schistosoma japonica* and the tenth had Hookworm and Trichocephalus. The author is of opinion that there is danger of infection from the foreign students as they, and particularly orientals, are more frequently infected.

R. T. L.

HENAO (E.) & TORO VILLA (G.). **Parasitismo intestinal.**—*Revista Clinica.* Medellin. 1916. Sept. Vol. 1. No. 2. pp. 57–71.

Statistics of the relative frequency of the different species of intestinal parasite met with in the course of coprological observations made on a hundred cases at the San Rafael Hospital of the Antioquia

TABLE XIV.

Influence of Duration of Institutional Life on Infection with Various Entozoa.

Duration of Institutional Life.	Examined.	Trichiuris.		Hookworm.		Ascaris.		Strongyloides.		Hymenolepis.	
		No.	%	No.	%	No.	%	No.	%	No.	%
30 days or less	500	3	0·60	111	22·20	12	2·40	4	0·80	3	0·60
31 days to 1 year	251	41	16·33	51	20·32	55	21·91	24	9·56	2	0·80
2 to 3 years	146	63	43·15	31	21·23	41	28·08	27	18·49	1	0·68
4 to 6 years	121	68	56·20	23	19·01	36	29·75	32	26·45	0	0·00
7 to 10 years	79	44	55·70	5	6·33	27	34·18	18	22·78	0	0·00
11 to 15 years	57	34	59·65	5	8·77	12	21·05	12	21·05	0	0·00
Over 15 years	70	40	57·14	2	2·86	19	27·14	12	17·14	0	0·00
Admission cases	500	3	0·60	111	22·20	12	2·40	4	0·80	3	0·60
Old cases	724	290	40·06	117	16·16	190	26·24	125	17·27	3	0·41

Railway, and the municipal laboratory at Medellin (Colombia). A percentage table is given:—

	Hosp. S. Rafael.	Lab. Urbano.
Strongyloides	16	9
Taenia	1	3
Ancylostoma	88	48
Trichocephalus	60	76
Ascaris lumbricoides ..	67	66
Ascaris canis	0	14
Oxyuris vermicularis ..	0	8

[The number of new cases infected with the dog Ascaris is especially notable.]

R. T. L.

Soulié (Henri) & Derrieu (G.). **Parasitisme intestinal des enfants des écoles maternelles d'Algérie. Détermination d'un indice parasitaire. Application de cet indice à la mesure de la pureté des eaux de boisson.**—*Bull. Soc. Path. Exot.* 1916. Dec. Vol. 9. No. 10. pp. 795–802.

In thirty-four infant schools [*écoles maternelles*] in thirty different districts of Algeria 49 per cent. of 316 children were found to harbour intestinal worms. These children had been born in the district and had always remained there; 309 were Europeans or naturalised Jews and 7 were native Moslems. Their ages lay between two and six. One hundred and thirty-four were infected with one species of parasite only. Twenty had two species while one alone was infected with three different forms. The varieties met with were *Ascaris lumbricoides*, *Trichocephalus trichuris*, *Oxyuris vermicularis* and *Hymenolepis nana*.

The whipworm occurred most frequently. It was found in 77 children: alone 64 times, and 13 times in association with other forms. Next in order of frequency was *Hymenolepis nana*. This was present in 64 children, alone 50 times and in association 14 times. Usually the eggs of this form were very abundant, no less than five being seen in a single field of the microscope. *Ascaris lumbricoides* occurred 15 times alone, and 30 times with other parasites. *Oxyuris vermicularis* was recorded in five cases alone and in six cases in association.

As the development of these intestinal nematodes is direct and their spread effected chiefly by water the authors consider that the extent of infection can be taken as an indication of the degree of contamination of water by faecal matter and that the "parasitic index" of the children of each locality would be more valuable as an indication of the purity of the water supply than frequently repeated bacteriological analyses.

R. T. L.

Macfie (J. W. Scott). **A Note on the Provisional Identifications of Worms collected at Accra.**—*Report of the Accra Laboratory.* 1915. pp. 80–81. London: J. & A. Churchill.

In a list of provisional identifications, by Dr. J. W. W. Stephens, of parasites of domesticated animals, it is noted that Cysticercus is a very common parasite of the pigs slaughtered at Accra. The lungs are infected with *Metastrongylus apri* and the kidney with *Stephanurus dentatus*. *Belascaris mystax* was obtained from a cat. *Hymenolepis diminuta* occurred very frequently in the brown rat. The other entozoa are of no medical significance.

R. T. L.

GABBI (Umberto). **Sulla maggiore diffusione geografica delle malattie tropicali già esistenti in Italia e sulla presenza di due nuove di esse: la Filariosi e la Bilharziosi.** [Increased Spread of Tropical Diseases existing in Italy with two fresh ones: Filariasis and Bilharziasis.]—*Malaria e Malat. d. Paesi Caldi.* 1916. Sept.-Dec. Vol. 7. No. 5-6. pp. 301-304.

The author tabulates the various tropical affections that have been noted within recent years in Italy and notes the incidence of a single endemic case of filariasis and a recently imported case of bilharziasis from northern Africa.

R. T. L.

COUTANT (A. F.). **Chenopodium Poisoning. Report of Case.**—*Jl. Amer. Med. Assoc.* 1916. Nov. 25. Vol. 67. No. 22. pp. 1599-1600.

Amongst about 300 cases of hookworm disease treated in Texas with oil of chenopodium one case of poisoning occurred, The dose used in routine was ten minims on each of three consecutive days. The capsules were taken half an hour before a light breakfast. The other meals were as usual. Following the last dose a dose of salts or castor oil was given after an interval of two hours. The report of the case in which poisoning supervened is given verbatim :—

> "The patient was a young man who gave the history and symptoms of severe uncinariasis, and showed the ova in the faeces. Though 21 years of age, he weighed only 95 pounds, was very anaemic, and was so weak that he had not been able to work for several months. He was extremely nervous, and was subject to nervous 'spells,' accompanied by intense headache. He had also had several attacks of recurring malaria during the few months just preceding.
>
> "The patient had taken two doses of chenopodium twenty-four hours apart, or 20 minims in all. On the afternoon of the second day of treatment, ten hours after taking the second dose, he was suddenly seized with severe, griping, cramplike pains in the abdomen, vomiting, intense headache, and nervous twitchings and tremors of the extremities. The temperature rose to 102 degrees, with sweating. The nervous condition progressed in a short time to a state of nervous prostration, and the patient became hysterical and was irrational for several hours. A local physician who was called in by the family found the patient on the verge of collapse—extremities cold and clammy, pulse shallow and rapid, heart weak. He administered strychnin, digitalis and nitroglycerin with the object of improving the circulation, applied warmth to the extremities, etc., and the patient rallied. Five grains of calomel were also administered. The stool resulting from this purgation was blood-tinged and contained much mucus and many hookworms.
>
> "The next morning the patient had another attack, not quite so severe, with intense abdominal cramps, vomiting, nervous symptoms, and temperature of 100·6 F. The patient again became very weak, the heart

rapid and feeble, and more stimulants were given. The patient improved slowly, and was so exhausted that he did not get out of bed for two weeks."

In the comments on this case it is recalled that twelve cases of poisoning have been reported by LEVY in the United States. The smallest dose in these cases was 30 minims. Coutant is uncertain whether his case indicated a constitutional drug idiosyncrasy or whether the baneful results followed upon the general condition of the patient or some undiscovered intestinal lesions which allowed of unusual absorption of the drug.

R. T. L.

HOOKWORM CAMPAIGNS (1915).*

Antigua.†

After the preliminary survey conducted by Dr. Eric MARSHALL from August 1st to November 27th, 1914, arrangements were made to carry on preliminary operations on the intensive plan in the York Valley District. This area, roughly two miles in diameter, includes ten villages, with a combined population of 1,956 persons of whom almost all are negroes. The work commenced on September 15th, 1915, under Dr. P. W. COVINGTON and up to December 31st, 1915 98·2 per cent. of the inhabitants had been examined.

Antigua, 1915.‡

	No.	Per cent.
1. Census	1,956	
2. Examined	1,921	98·2
3. Found infected	524	27·3
4. Given first treatment	432	82·4
5. Cured .. .. 5a. (percentage of treated cured 65·7)	284	54·2
6. Removed from area (or dead)	24	4·6
7. Remaining in area uncured	216	41·2
Not cured for medical reasons .. .. 35 Still to be treated 181		

The percentage of cure following treatment is 65·7.

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* For 1914 see this *Bulletin*, Vol. 8. pp. 525–35.

† Report on Ankylostomiasis in Antigua. By E. S. MARSHALL, M.R.C.S., L.R.C.P., D.T.M. & H. 1915. Antigua: Printed at the Government Printing Office.

‡ This and succeeding statistical tables are composite tables drafted by the sectional editor to include information given in separate tables in the original.

In this district only ten out of 413 homes visited were found to be provided with satisfactory latrines. No definite result in the direction of enforcing the installation and proper maintenance of suitable latrines had been attained up to December 31st, 1915.

From Dr. COVINGTON'S Report* on Work for the Relief and Control of Uncinariasis in Antigua from August 1st, 1914 to December 31st, 1915, the following additional items of interest are added :—

" *Topography.*—The York Valley District is surrounded on all four sides by hills. These form for it a natural boundary. The valley itself is low-lying and unforested, with only a few streams running through it. Agriculture is the principal industry and sugar the principal crop. There are but few large estates, most of the farming being done on small holdings belonging to the people.

" *Conditions of Life.*—The inhabitants live in scattered villages. In one village there may be a population of only 100 persons, while in the next there may be 600. Between two villages there is often a mile or more of uninhabited territory. Because of this uneven distribution of the population, the district was divided into areas each composed of several villages.

" While the sugar crop is being harvested, many of the people leave their homes and work as labourers on the large plantations. At other times they live on their own small holdings in homes which are little more than hovels. They have no knowledge of hygiene or sanitation. The main water supply comes from open, roadside ponds, not covered in any way and receiving all sorts of surface drainage."

British Guiana (1915).†

Operations reported upon for 1915 were undertaken in two districts : (1) Peter's Hall District.—This district has villages and sugar plantations on both sides of one long road. There are few isolated houses. The work was confined to the free population numbering 10,380. Indentured labourers on sugar plantations were excluded, as they were being effectively treated under another scheme.

(2) Belle Vue District lies on the west bank of the Demerara River opposite Peter's Hall. It is about 14 miles long, with valleys and sugar plantations on both sides of a public road. The free population numbered 11,943.

This district lies at a lower level than the high tides, abounds in dense vegetation and is completely inundated during the rainy season. It is one of the most unsanitary districts in the colony.

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* Report on Work for the Relief and Control of Uncinariasis in Antigua from August 1st, 1914 to December 31st, 1915. By P. W. COVINGTON, M.D., Medical Officer in Charge, 1916. New York City: International Health Board.

† Rockefeller Foundation, International Health Commission Second Ann. Rep. Jan. 1st, 1915–Dec. 31st, 1915. [Dr. Wickliffe ROSE, Director-General.] 1916. New York :—Offices of the Commission, 61, Broadway. pp. 76–86.

British Guiana (1915).

	No. of Persons.		
	Peter's Hall District.	Belle Vue District.	Total.
1. Census	10,380	11,943	22,323
2. Examined	9,537	11,533	21,070
3. Found infected	5,590	7,545	13,135
4. Given first treatment ..	5,160	6,743	11,903
5. Cured	4,109	5,930	10,039
Percentage infected cured	73·5	78·6	76·4
Percentage of treated cured	79·6	87·9	84·3
6. Removed from area (or dead)	717 (=12·8%)	697 (= 9·2%)	1,414 (=10·8%)
7. Remaining in area uncured	764 (=13·7%)	918 (=12·2%)	1,682 (=12·8%)
7a. Not cured for medical reasons	160	338	498
Still to be treated ..	604	580	1,184
8. Not located	843	410	1,253

Sanitary Improvement. - Laws are in existence requiring the erection of suitable latrines. In the two districts 6,147 homes were inspected. Of these only 41·1 per cent. were found to be provided with latrines. During the progress of the campaign no less than 1,394 new latrines were erected. In addition to this many other homes were required to improve the latrines to conform to the standard adopted. "Main and interlot drains were cleaned out; vats and barrels screened; dense overhanging bush and unnecessary vegetation cleared away; many unsanitary buildings removed; bakehouses and provision shops cleaned and reconstructed; accumulations of rubbish removed; and ventilation improved." The Surgeon-General reports, "it may be of interest to know that from the Peter's Hall and Belle Vue districts, where the work has been conducted, the number of persons seeking medical relief at the public hospital at Georgetown has been much reduced whereas from the city and from the country districts where the work has not been conducted the number has increased."

Grenada (1915).*

The work was continued in 1915 under Dr. Angus MacDONALD. The agricultural pursuits of the people and the widely scattered population made a thorough-going house to house visitation and treatment almost impossible. The actual taking of the medicine by the patient was not under the supervision of the nurse. The plan of campaign does not therefore conform in detail either to the established routine of the " dispensary " or of the " intensive " method [see this *Bulletin*, Vol 8, p. 526].

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* Grenada. International Health Commission (Ankylostomiasis Campaign). Analysis of the Work of a Year, Oct. 1914–Sept. 1915. By the Medical Officer in charge. MS. Report.

After February 1915 the field of operations was restricted to Mt. Moritz area, embracing about 7,000 acres in the parish of St. George's and the St. David's area, of about 12,000 acres, in the parish of St. David's. Work continued in these areas until July when an area of 6,000 acres contiguous to St. David's and known as St. Andrew's area was opened up. In this last area the work was continued until the end of the year.

These three areas embrace approximately about one-sixth of the population and one third of the total area of the island.

The total population dealt with up to the end of 1915 was 16,001. The earlier records deal with the number of specimens, not of people examined. Many persons were treated who were not recorded as infected. The actual number of those treated to a cure as demonstrated by microscopical examination was 3,346.

The cocoa-growing districts are the chief centres of infection. In the Mt. Moritz area, where the cultivation is largely open, 43 per cent. of the people were infected while in the St. David's and St. Andrew's areas, where dense cocoa cultivation prevails, the average was 67 per cent.

The Medical Officer in charge has submitted to the Governor of Grenada as an official report of his work an analysis covering the period October 1914 to September 1915.

In this report it is noted that hookworm infection is rare in the adjacent island of Carriacou. Out of 68 persons examined four only were found infected and of these two had resided in Grenada, one in Trinidad and one in British Guiana.

As regards Grenada it is stated that the hookworm infection for the entire population dealt with is estimated approximately as 57 per cent., while the rate varies in different areas from 42 per cent. to 70 per cent. It can only be said, however, that ankylostome infection in Grenada is a rare cause of serious specific disease. It is a complication which may and does detrimentally affect the people to an uncertain extent. Even mass infection is consistent with good physical condition. Severe anaemia has not been met with in the hookworm infected save in association with chronic malaria infection. Dyspepsia is general. Cardiac dilatation occurs equally in the uninfected and infected. The " undersized and undeveloped in hookworm countries are not always indicative of ankylostomiasis."

A useful clinical record of 5,792 patients is appended :—

Condition Record.

Total 5,792.

Infected with Hookworm 3,250.			Not infected with Hookworm 2,542.		
Condition recorded.	Total.	No. per mille.	Condition recorded.	Total.	No. per mille.
"Fair"	1,587	490	"Fair"	1,858	730
Anaemia	516	160	Anaemia	491	200
Dilated heart ..	51	16	Dilated heart ..	15	6
Undersized and Undeveloped ..	53	16	Undersized and Undeveloped ..	29	12
Other conditions ..	1,043	321	Other conditions	148	58

This record gives the actual condition recorded of

> "people who came for treatment because of some illness, and of others who merely submitted for examination under the scheme of the Campaign. 'Fair' was the highest value recorded and covers all conditions of health consistent with pursuance of daily vocations in the absence of any morbid condition worthy of record. There were 490 per mille 'fair' amongst those infected as against 730 per mille 'fair' of those not infected with Hookworm; indicating a lowered vitality on the part of those infected. Anaemia is recorded of 160 per mille of those infected, and of 200 per mille of those not infected. This points to some widespread anaemia producing factor acting more or less equally on the population whether Hookworm infected or not. 'Dilated Heart' is recorded in 16 per mille of the infected and 6 per mille of the non-infected. The hilly nature of the country and the general burden-carrying type of labour predispose to cardiac dilatation, which the figures suggest is accentuated by Hookworm Infection. The number of those recorded as 'undersized or undeveloped' is 16 infected and 12 not-infected per mille. These figures invite caution in ascribing this condition always to Hookworm Infection even when the patients are infected, but of the 16 who were treated there is record of immediate and rapid development and improvement in condition in at least 12. Several of the non-infected were treated without apparent result.
>
> "Considering the undoubted prevalence of geophagy in some countries and in populations also where Hookworm Infection may be eliminated, it is remarkable how rarely the condition is acknowledged by adults or children, or by parents of their children. It has been recorded in a few cases of children infected with Hookworm and not infected with Hookworm, and who also passed abundant Ascaris ova. There is evidence otherwise to suggest the greater prevalence of geophagy than the records show.
>
> "Among the 321 per mille of infected and 58 per mille of non-infected of whom other conditions are recorded, the chief record in both is dyspepsia with the usual gamut of vague and neurotic symptoms. But amongst those infected there are two signs not here specifically mentioned, which, in my experience, may almost alone be claimed to be pathognomonic of ankylostomiasis.
>
> "They are an expression of eye which it is difficult to describe and a mental condition which gives an appearance of stupidity.
>
> "These appearances are by no means present in all cases of Hookworm Infection, and they are not necessarily present in cases of anaemia which

may be called ankylostomiasis. These conditions of eye and brain are practically always associated and are not to be met with characteristically in those not infected with Hookworm. They appear to result from a delayed reaction time.

"The eye has variously been described as 'Fish Eye,' 'Bead Eye,' 'Anaemic Eye.' Its fixity is, I believe, the factor to which these names owe their origin. It has an opaque, staring look, sometimes associated with exophthalmos and the vessels of the conjunctiva—not due to obvious anaemia—(Haemoglobin may record 80) are scarcely to be seen. Attempt to direct the movements of the eye is met with difficulty, movements in all directions being obtained only after an appreciable interval of time.

"The mentality is similarly affected by slow reaction. The first impression is often that one is dealing with a fool; a sudden delayed response shows intelligence, and on more careful examination one may find a patient of quite average or over average intelligence suffering from a sluggish mentality that affects all his actions, physical as well as mental. This condition is most satisfactorily removed by the expulsion of the Hookworm. It has been recorded in 50 per thousand of those infected with Hookworm and has been seen much more frequently than is recorded. It has not been recorded of any not infected with Hookworm."

Dutch Guiana (1915).*

On October 15th, 1915, Dr. W. H. KIBLER opened a hookworm campaign on the intensive method at the Marienburg Estate on the Commewyne river about ten miles from Paramaribo. The estate has a population of 2,380 persons of whom 1,005 are Javanese, 894 East Indians and 448 blacks. The inhabited district covers less than one square mile.

The results to December 31st, 1915 are :—

	Marienburg Estate.	
	No.	Per cent.
1. Census	2,380	
2. Examined	2,322	97·6
3. Found infected	1,942	83·6
4. Given first treatment	1,809	93·2
5. Cured to date 31/12/15	492	27·2

Of 201 houses located on the Estate 71·1 per cent. were emptying their sewage into trenches, some of which had water in them during the rainy season only, others only during the period when the sugar factory was working. The remaining houses had no provision of any kind. Up to December 31st, 1915 seven latrines were provided to accommodate 27 houses.

St. Lucia (1915).†

Beginning January 1915 work in St. Lucia was conducted on the general lines of the intensive method as followed in other West Indian Colonies, except that the actual administration of the medicine was not under the direct supervision of a nurse. Work during the first six months was limited to the Cul-de-Sac Valley and in the latter half of the year to the Castries Valley. The former area is almost entirely rural. Dense masses of tropical vegetation grow throughout the area and there is, on the more level lands, extensive cultivation of sugar-cane intermixed with cocoa and lime crops. Ciceron is the only village. The Castries valley area is urban and suburban; more than half of the people live in the town of Castries.

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* Rockefeller Foundation International Health Commission, Second Ann. Rep., 1915. pp. 87–90.

† *Loc. cit.* pp. 98–107.

St. Lucia (1915).

	No. of Persons.			
	Castries Valley.	Cul de Sac Valley.	Total.	Per cent.
1. Census	4,648	3,501	8,149	
2. Examined	4,501 (96·8%)	3,423 (97·8%)	7,924	97·2%
3. Found infected.. ..	1,598 (35·5%)	2,838 (82·9%)	4,436	56%
4. Given first Treatment..	1,488 (93%)	2,618 (92·2%)	4,106	92·6%
5. Cured	1,119 (70%)	1,058 (37·3%)	2,177 (49·1%)	
6. Removed from area (or dead)	170	133	303 (6·8%)	
7. Remaining in area uncured	309	1,647	1,956 (44·1%)	

The failure to cure the majority of cases noted as remaining in the district uncured was due to the fact that these persons were not persuaded successfully during the period under review to continue treatment to a cure. Only 220 persons refused to accept first treatment.

Sanitary Improvement.—" It has never been the custom in St. Lucia to build latrines or even to make any general use of commodes. The almost invariable practice of the native population is to use earthenware utensils of varying kinds and sizes, the contents of which are either dumped into a covered pail for subsequent disposal or the vessel itself covered with an ill-fitting piece of wood and put aside until, under cover of darkness, its contents can be thrown away. It has not been found an easy matter to overcome this practice. Even in some cases where the people have been persuaded to install latrines, these are used only as a place into which vessels may be emptied.

" Within the town of Castries water sewerage is impracticable; consequently a system of removal by pails is in use. A sewage barge anchors nightly in the river, and all night long the inhabitants parade to the barge with their receptacles of sewage matter. On the nights of November 2–3 and 3–4, 1915, both fine and clear, the number of receptacles taken to the barge was 438 and 560, respectively—an average of 499 per night. By the census of 1911 the population of Castries was 6,266; the number of inhabited houses, 1,329. Assuming that all the receptacles were brought from homes within the limits of the town, this means one receptacle to

every two and one-half inhabited houses, or one to every twelve and one half persons, indicating that at only 40 per cent. of the homes within the town limits is effort made to secure a satisfactory disposal of the sewage. But there are many householders within or near the out-skirts of the town who claim that they also make use of the sewage boat; in the area where work was conducted, twenty-seven families made this claim. If the number of receptacles taken to the boat by these out-of-town families should be deducted from the average of 499, the number of houses or persons per receptacle within the town limits would be still higher."

Between September 1st and December 31st, 1915, each householder was interviewed personally and an effort was made to persuade him to build a latrine. The people took kindly to the idea. No legal prosecutions proved necessary. By the end of the year out of 419 houses in the suburban area of Castries no less than 119 houses were provided with adequate means of sewage disposal, while in 62 other homes latrines were in course of erection.

St. Vincent (1915).*

The hookworm campaign in this colony was commenced on May 1st, 1915. The work was carried out under the direction of Dr. W. P. JACOCKS and followed the "intensive method." By the end of the year operations had been completed in the districts Calliaqua and Belair. The former is located three miles from Kingstown, its base extends four miles along the sea coast and its other boundaries meet three miles inland at Belmont. Practically all the land is under cultivation. In addition to the town of Calliaqua there are a number of villages. The Belair district adjoins the Calliaqua district but is wholly inland. Most of the inhabitants live in one or other of seven small villages. There is no indentured labour.

	No. of Persons.			
	Calliaqua.	Belair.	Total.	Per cent.
1. Census	2,544	1,281	3,825	—
2. Examined	2,544	1,278	3,822	99·9%
3. Found infected	801	875	1,676	43·9%
4. Given first treatment ..	773	817	1,590	94·9%
5. Cured.. .. .. .. Percentage of infected cured 80·5.	627	723	1,350	84·9%
6. Removed from area (or dead)	0	2	2	
7. Remaining in area uncured (19·5% of infected persons) Under treatment .. 219 Medical reasons .. 75 Refused treatment 30 Inaccessible .. 2			326	

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* *Loc. cit.* pp. 108–114.

Sanitary Improvement. –In the area worked there were 736 homes, of which only 86, i.e., 11·7 per cent. had latrines. By the end of the year 348 new latrines were built.

Dr. W. P. JACOCK's Report* gives the following interesting figures as to per capita cost. In the work conducted in St. Vincent up to December 31st, 1915, a total of $4,118.44 was expended. The number of persons examined was 3,822 and those treated were 1,590. From this the cost per person examined is found to be $1.08 and the cost per person treated $2.59.

A useful table is also given showing the number of treatments found necessary to effect cures.

Total persons cured.	1,350.
Cured by 2 treatments	623 = 46·1%
,, 3 ,,	376 = 27·9%
,, 4 ,,	210 = 15·6%
,, 5 ,,	76 = 5·6%
,, 6 ,,	43 = 3·2%
,, 7 ,,	17 = 1·3%
,, 8 ,,	3 = 0·2%
,, 9 ,,	— —
,, 10 ,,	2 = 0·1%

Trinidad (1915).†

The " Dispensary operations " previously conducted in this colony were replaced at the commencement of 1915 by a dispensary modification of the " intensive method." The work was supervised by Dr. C. G. H. CAMPBELL and Dr. B. E. WASHBURN. The area first selected is located near San Fernando and embraces seven villages including Ste. Madeleine. On May 15th, 1915, however, this was suspended and operations under the official " Intensive Method " were begun around the village of Tunapuna, about nine miles from Port of Spain. The area is densely populated; about 60 per cent. of the inhabitants are Creoles and 40 per cent. East Indians ; it is about two and a half miles long and less than a mile wide. The territory was divided into 18 districts. Work had been completed in 13 of these by the end of the year, the results obtained are shown in the following table.

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* Report on Work for the Relief and Control of Uncinariasis in St. Vincent from August 16th, 1915, to December 31st, 1915. By W. P. JACOCKS, M.D., Medical Officer in Charge. 1916. New York City : International Health Board.

† Rockefeller Foundation International Health Commission, Second Ann' Rep., 1915. pp. 115–122.

Trinidad, 1915.

	No. of Persons. 13 districts of Tunapuna.	Per cent.
1. Census	6,498	—
2. Examined	5,943	91·5%
3. Found infected	4,000	67·3%
4. Given first treatment ..	3,632	90·8%
5. Cured	2,712	47·7%
(Percentage of infected 67·8)		
6. Removed from area (or dead)	530	13·3% of infected.
7. Remaining in area uncured ..	758	19% of infected.
Refused 536		
Medical reasons .. 220		

Sanitary Improvement.—In the Tunapuna district there are 1,146 homes; 97·3 per cent., i.e., all but 31, now have sanitary latrines and efforts are being made to have latrines erected at the remainder.

Costa Rica (1915).*

Operations on the dispensary plan were commenced by Dr. L. SCHAPIRO on April 8th, 1915, in succession to Dr. H. R. CARTER. During the year work was extended to include the six provinces Alajuela, Limon, Cartago, San José, Heredia, Puntarenas and Guanacaste. Only the most favourable points of attack were selected. The whole area was only partially covered and the work was not concluded in any province.

During the year 57,979 specimens were examined; of these 34,840 or 60·1 per cent. were found to be positive. First treatment was administered to 23,597 persons.

Sanitary Improvement.—An inspection of 8,261 homes was made. At the first visit only 867 or 10·5 per cent. of these were provided with latrines. During the year the number rose to 1,256 or 15·2 per cent.

Guatemala (1915).†

Dr. W. H. ROWAN commenced active work on March 15th, 1915, as head of the Department of Uncinariasis. Operations almost identical with the intensive method were initiated but microscopical re-examination for determining cures was not made a feature of the work so that figures are unavailable as to the number of persons remaining uncured in each district.

By the end of the year 87 coffee estates containing a population of 28,090 persons had been dealt with. 25,587 or 91·1 per cent. were microscopically examined and 15,001 or 58·6 per cent. of these were found infected. First treatment was given to 13,783 persons, i.e., to 91·9 per cent. of those found infected.

Sanitary Improvement.—Only four latrines were found at the homes of the labourers during the year. There were 185 latrines on the estates. 1,048 new latrines for labourers' families were constructed by the Department at the cost of the estate owners and provided accommodation for about one half of the population of the estates.

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* *Loc. cit.* pp. 123–131.

† *Loc. cit.* pp. 132–140.

Nicaragua (1915).*

Active work commenced on October 1st, 1915, and has been confined to the Department of Chinandega. During the month dispensary operations were carried out on San Antonio, the largest sugar plantation in Central America. It is situated about four miles from the town of Chichigalpa. During November work was started in the town of Corinto on the Pacific Coast. In December headquarters were established at Chinandega town. In November and December some preliminary survey work was also done in the department of Managua.

	San Antonio.	Corinto.	Chinandega.	Managua.
Microscopically examined	941	1,172	976	2,340
Found infected ..	673 (71·5%)	940 (80·2%)	480 (49·2%)	588 (25·1%)
Given first treatment	399	592	362	258

Sanitation.— A survey of 469 homes in the town of Corinto showed that only 185 or 49·1 per cent. had latrines of any kind and of these 142 were of the open-back type entirely inadequate for preventing soil pollution.

*Panama.**

Operations in Panama follow the dispensary plan, but whenever practicable treatments are followed up and re-examinations made for determining cures. The sparseness of the population, the difficulties of travel and communication, and the absence of large towns or estates giving employment to hundreds of people seem to make the dispensary method the better way of providing relief. Up to December 31st, 1915, work had been carried out in fifteen districts of seven provinces of Panama. This area formed 30 per cent. of the total area of the country and contained 35 per cent. of the total population. The work is not yet completed.

Dispensary Work, 1915.

	Provinces.					Total.
	Panama.	Bocas del Toro.	Colon.	Cocle.	Herrera.	
Microscopically examined ..	6,793	5.879	1,379	7.797	3,162	25,010
Found infected	4,188	3,240	1.144	5.879	2,439	16,890 (67·5%)
Given first treatment ..	3,963	3.024	966	4,924	2,041	14,918 (88·3%)

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* *Loc. cit.* pp. 141–145.

* *Loc. cit.* pp. 146–151.

Both in percentage and degree of infection the natives along the Atlantic Ocean and in the foothills of the mountains on the Pacific side, where the dry season is not well defined and the people are engaged mainly in agriculture, have been found to suffer most.

The infection ranges from 85 to 95 per cent., and the haemoglobin index is below 60. On the Pacific side, where there is no moisture for three months in the year, the people of the plains have a percentage of infection below 65 and an average haemoglobin over 70.

Sanitary Improvement.—Elementary sanitation is one of the greatest needs. There are few latrines of any description and these are a menace rather than a protection. During the year about one half of the school houses of the Interior have been equipped with latrines.

Egypt (1915).[*]

Owing to the war the work of two travelling hospitals established on September 5th, 1914, at Belbeis and at Minia-el-Qamh was temporarily abandoned on April 8th, 1915. From January to April, 1915, a survey was conducted in Assiut; 4,411 persons were examined and 2,018 i.e., 45·7 per cent. were found infected. The survey was confined to men and boys. A very considerable difference was found to exist between the infection in the large towns and in the country villages. In the former 22·7 per cent. of the boys were infected, in the latter it was 51·1 per cent., while in Assiut the capital town of the province only 4·4 per cent. of the boys were infected. The statistics of the hospital dispensary work in Sharqia do not give the figures for the year 1915 separately. It is noted that from December 13th, 1913, up till April 8th, 1915, altogether 20,865 persons were microscopically examined and 59·7 per cent. were found infected. All infected persons were housed and fed in the travelling hospitals until the full course of treatment was completed. "Many of them come from hundreds of miles to receive the benefit of treatment, some floating down the Nile on rafts from remote sections of Upper Egypt."

Notes on Diagnosis and Treatment of Hookworm Infections.[*]

Technique of Examination.—During 1915 a series of experiments was made in Trinidad and British Guiana to determine the value of the centrifuge as an aid in the correct diagnosis of ankylostome infections. The results are strikingly similar and go far towards establishing a correct technique of microscopical examination. By combining the examination of a number of ordinary smeared slides with that of a number of smeared slides made after centrifuging the specimen an improvement of approximately 11 per cent. was obtained over the ordinary smear slide process.

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[*] *Loc. cit.* pp. 152–158.

[*] *Loc. cit.* pp. 166–173.

TABLE I.

Trinidad and British Guiana—Intensive Work: Comparison of Results of Microscopic Examination with and without Use of Centrifuge.

Country.	Smeared Slide Method: Without Use of Centrifuge.			Combined Method: Smeared Slides and Centrifuged Smeared Slides.			Difference in Favor of Combined Method With Use of Centrifuge.	
	Specimens Examined.	Specimens Positive.	Percentage Positive.	Specimens Examined.	Specimens Positive.	Percentage Positive.	Specimens Positive.	Percentage Positive.
Total ..	2,134	1,049	49·2	2,134	1,277	59·8	228	10·6
Trinidad ..	1,434	741	51·7	1,434	895	62·4	154	10·7
British Guiana	700	308	44·0	700	382	54·6	74	10·6

In Trinidad the results of the test led to the adoption of the examination of two smeared slides before centrifuging, and two after, as the routine method of diagnosis. In British Guiana five to eight smeared slides are examined before centrifuging and five after. For examination after treatment this process is reversed. It is doubtful however whether the examination of so many smears is justified by the results obtained.

In British Guiana a series of experiments was carried out to determine whether or not the thorough examination of one specimen following treatment is sufficient for demonstrating cure and what interval of time should intervene after the last treatment. Ninety-nine cases which had received only two treatments and which had been pronounced cured, on subsequent microscopical examination of one specimen, were re-examined again with the aid of the centrifuge after the lapse of another month. In six cases only were ova detected.

*Treatment.**—One treatment for ankylostomiasis seldom effects a cure. Two treatments usually cure about half of the infected persons treated. Those not so amenable are stated to be those in whom the infection is of long standing or persons in whom the infection is very heavy.

In most of the campaigns thymol is regularly used. This is administered in capsules preceded and followed by Epsom salts. The procedure adopted is as follows:—

"The patient is instructed to take little or no supper on the evening before the thymol is to be administered. As early at night as is convenient

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* *Loc. cit.* pp. 173–185.

he takes a dose of Epsom salts. The next morning, as early as the salts have acted half the number of capsules of thymol prescribed for the whole treatment is taken. . . . Nothing is eaten on the day the capsules are taken until the final dose of Epsom salts has acted well. A little water or strong coffee, without milk, alone is allowed. . . . Gravy, butter, milk, all alcoholic drinks and patent medicines, which generally contain alcohol, are forbidden on the evening before and on the day of treatment. . . . The patient is advised to lie on the right side for at least half an hour after taking each dose of thymol."

The dosage usually administered is tabulated.

Age in Years.	Grains.	Grams.	6 a.m.	8 a.m.
1 to 5	7·5	0·5	½ dose	½ dose.
5 ,, 10	15	1	½ dose	½ dose.
10 ,, 15	30	2	½ dose	½ dose.
15 ,, 20	45	3	½ dose	½ dose.
20 ,, 60	60	4	½ dose	½ dose.
60 upwards	45	3	½ dose	½ dose.

In the absence of hospital conditions the dosage is usually from ten to twenty per cent. less than indicated above. The dose is determined by the apparent and not the actual age of the patient. Experiments in Trinidad during 1915 showed that whereas among 325 cases treated with pure thymol finely powdered only 12·6 per cent. were cured by two treatments, of 1,112 persons treated with finely pulverised thymol mixed with *equal parts of sugar of milk* 49·1 per cent. were cured by two treatments.

During 1915 experiments were made with oil of chenopodium as a substitute for thymol. In Guatemala it was used in more than 9,000 cases and was reported to be fully as efficient as thymol and less trying to the patient, permitting a subsequent treatment within four days. The only untoward symptom noted was temporary deafness in two children. The maximum doses used are tabulated here. They were given in one time or in halved doses with an interval of one or two hours.

No noticeable difference in result was seen.

Age in Years.	Drops.	Age in Years.	Drops.
4	5	13	20
5	7	14	21
6	10	15	22
7	11	16	24
8	12	17	25
9	14	18	27
10	15	19	28
11	16	20 and over.	30
12	18		

The results in Nicaragua and Costa Rica are also reported as excellent and no untoward symptoms were observed. In Trinidad however Dr. WASHBURN found chenopodium less effective. He reports that "in all of the cases treated with oil of chenopodium in Trinidad unpleasant symptoms, such as nausea, vomiting, weakness, dizziness, etc. were much more marked than with thymol," and its continued use in a district "alarmed the people and made them afraid to take further treatment of any kind."

HELMINTHOLOGICAL NOTES.

*Nigeria.**

Ankylostome Survey.

	Total Cases Examined.	Percentage Infected.
Calabar	66	97%
Okigwi	43	97%
Agbor	57	89%
Udi	72	81%
Badagry	59	69%
Okwoga	63	65%
Ibadan	200	60%
Lagos gaol	50	48%
Benin City	139	43%
Degema	35	31%
Opobo	100	22%
Bonny	100	20%
Warri	104	18%
Total	1,088	52%
Yaba Lunatic Asylum and Native Staff Medical Institute	136	98%

Dr. MACLAINE found that although infection is general at Ikot-Epene severe cases of anaemia were practically unknown. He saw no cases of the disease during 1915 except in some prisoners returned from Port Harcourt, in whom the strain of severe labour (railway work) had been the predisposing factor. Dr. Jackson MOORE believed that fully 60 per cent. of the cases at Ibadan which showed ova in the stools appear in good health, and they did not complain.

Dr. MACFARLANE at Opobo formed the opinion that ankylostome ova were generally found in the anaemic and flabby looking. He considered it almost safe to diagnose the presence of the parasite without a microscopical examination, simply by the appearance of the individual. He also stated that the appearance of the people in the Opobo district suggested that many of them suffer from the ravages of the disease.

The opinions quoted above are those of medical men who have had a large experience over a number of years in Nigeria. Summarising generally it may be said that severe cases of ankylostomiasis are uncommon, but that in certain districts a certain amount of anaemia occurs, probably due to the presence of the worm.

Egypt.†

The following useful information regarding the incidence of urinary bilharziasis in Upper Egypt is taken from Dr. MacCALLAN's Report.

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* Annual Medical and Sanitary Reports of the Northern and Southern Provinces for the Year ending 31st December, 1915.

† Report on Ankylostomiasis Survey, Assiut Province, 1915. By Major A. F. MacCALLAN, R.A.M.C., MS. Report.

ASSIUT PROVINCE.

[Urinary] Bilharzia.

Police Area.		No. Examined.	Infected.	Per cent. Infected.
(1) Assiut	Town ..	301	4	1·3
	District ..	505	6	1·2
(2) Manfalut	Town ..	100	1	1
	District ..	505	22	4·3
(3) Derrut	Town ..	100	2	2
	District ..	500	126	25·2
(4) Mallawi	Town ..	100	24	24
	District ..	500	193	38·6
(5) Abnub	Town ..	100	3	3
	District ..	500	11	2·2
(6) Abu-Tig	Town ..	100	3	3
	District ..	500	19	3·8
(7) Badari	Town ..	100	10	10
	District ..	500	19	3·8
Total		4,411	443	10

MALARIA.

PUNJAB. **Report on Malaria in the Punjab during the Year 1915, together with an Account of the Work of the Punjab Malaria Bureau.** [Col. H. HENDLEY, M.D., K.H.S., I.M.S., Chief Malaria Medical Officer, Punjab.]—7 + xxxi pp. With 3 charts and 5 maps. 1916. Lahore: Printed by the Superintendent, Government Printing, Punjab. [Price Rs.2-4-0 or 3*s.* 4*d.*]

As an inevitable consequence of the War there has been no continuity in the administration of the Punjab Malaria Bureau, which is now as a temporary measure in the hands of the Inspector-General of Civil Hospitals. The Report is in the main a brief commentary on the graphic statistical records, which include three charts illustrating fever mortality by quotannual series, month, and season, and five maps showing relative intensity of malaria (as inferred from "fever" mortality and periodic spleen-censuses) by administrative geographical divisions. The Report states that in the year 1915 there was no epidemic of malaria in the Punjab and that the deaths from "fevers" aggregated 284,784, a rate of 14·72 per mille, the annual average of the last 48 years being about 350,000, but it draws attention to the fact that the raw material of these statistics is very largely derived from the village watchman, who though he may know what belongs to a watch has no need of such vanity as nosology. The fever mortality was again highest in the district of Muzaffargarh, and high in all the districts lying immediately east of the Indus. The districts between the watersheds of the Indus system and the Ganges system again show a comparatively low mortality. In the districts between the watersheds of the Ghaggar and the Jumna the mortality was very much less than in the year 1914.

A remarkable feature of the spleen-census maps is that in 19 out of the 26 districts the spleen-index is very much lower in November, when fever mortality is on the increase, than in June, when the mortality is declining. The only districts in which the spleen index is consistently high are Kangra, Montgomery, Muzaffargarh, Mianwali, and Shahpur, which may probably therefore be regarded as the most formidable endemic areas.

In the laboratory a few experiments were made with larvicides, and many individual mosquitoes were examined for infection. Hundreds of *A. rossi* were dissected, without result, but it is not stated whether the individuals dissected represented all seasons and many localities.

A proposal is mooted that all schools should be supplied with specimen-tubes containing mosquitoes of different kinds; and yet, for aught we see, they are as sick that surfeit with too much as they that starve with nothing.

A. Alcock.

RICHARDSON (Q. H.). **The Shatt-el-Arab River, with Special Reference to Malaria.**—*Jl. Roy. Nav. Med. Serv.* 1917. Jan. Vol. 3. No. 1. pp. 33–37.

The author gives an interesting sketch of the river and its surrounding flats, and a concise record of his experience both therapeutic and preventive in dealing with malaria. About 87 per cent. of the cases affecting the ship's company were benign tertian, the remainder being subtertian. Mosquitoes were not seen in January, February and March.

In the treatment of cases quinine was given to the extent of 20 gr. daily for the first three days, 10 gr. daily for the next three days, and then 5 gr. daily for a week; this being followed by a regular amount of quinine daily for a term depending chiefly on season.

For preventive purposes 20 gr. of quinine weekly to each member of the ship's company was found to be insufficient, but one gathers that 30 gr.—i.e., 5 gr. daily at breakfast-time on six days of the week—was successful.

Screening a ship (against mosquitoes) in such a suffocating climate is out of the question. Mosquito-nets were used, and for protecting men at mess between decks smouldering katol sticks were found effective. The author adds that these sticks are regularly used in the ships of the Royal Indian Marine.

A. A.

SWELLENGREBEL (N. H.). **Quelques notes sur la distribution géographique des anophélines et du paludisme, à Sumatra.**—*Ann. Inst. Pasteur.* 1916. Nov. Vol. 30. No. 11. pp. 593–599.

This is a suggestive paper, the author utilizing the experience acquired in Sumatra to point several—albeit somewhat trite -morals: namely that those who practice in malarious countries should make a very exact and exhaustive study of the local anopheline fauna; that entomologists should assist by simplifying nomenclature and setting specific features in strong relief, and that generalisations respecting malaria-susceptibility should be made with infinite caution, seeing that a species (the author instances *A. maculatus*) which in certain conditions is a dangerous carrier, may in other conditions be quite innocuous.

As regards matters of fact, the author informs us that the Anopheles of the plain of Deli are *rossi, ludlowi, albirostris, leucosphyrus, sinensis, barbirostris, albotaeniatus, umbrosus,* and *kochi.* That at Deli itself malaria is insignificant, though along the littoral, where *A. rossi* and *ludlowi* are prevalent, it may be rife. That at Médan, in the interior, although *A. sinensis* is common, fever among Europeans is not known. That on a certain Deli plantation, where the only species found is *A. leucosphyrus* malarial fever has recently increased [it is noteworthy that ROPER in North Borneo elicited somewhat the same circumstantial evidence against this species (this *Bulletin*, Vol. 5, p. 308)]. That at Sibolga, on the west coast of the island, where *A. ludlowi* is the commonest species, malaria is momentous and the splenic index extremely high.

A. A.

i. BRAUN. **Le paludisme au Maroc en 1915.—Maroc occidental.** —*Arch. de Méd. et de Pharm. Milit.* 1916. Nov. Vol. 66. No. 5. pp. 593–645. With 5 charts & 2 maps.

ii. SICARD. **Le paludisme au Maroc en 1915.—Maroc oriental.**—*Ibid.* pp. 646–654. With 2 charts.

i. This is an interesting report, but as it is of the administrative species there is not much to take hold of. It shows that malaria is generally endemic in western Morocco, owing to the habits of a nomadic population which in its extensive wanderings is accustomed to sojourn at certain seasons in marshy places where pasturage is assured. The disease however is not, in the opinion of the local government, sufficiently burdensome to justify the enormous expense of a radical cure by approved Panama methods.

Owing to the prolongation of the spring rains the year 1915 was malarious more than normal. Among the troops there were 4,977 admissions, 66 per cent. of the cases being benign tertian, and 34 per cent. sub-tertian. The mortality was 8·08 per mille of cases, 0·6 per mille of strength. More than 17 per cent. of the cases occurred in August; but July, September, and October were only a few degrees less malarious; the least malarious months were February and March; but January, April, and May were only a few degrees worse. The author believes thoroughly in quinine.

The general principles of prevention are ably discussed; practically the sanitary service was limited to quinine prophylaxis, which apparently was not generally carried out with the enthusiasm begotten of faith.

A good deal more than half the report deals with the distribution of malaria by political sub-divisions and districts.

ii. This report also is mainly of departmental interest. The author mentions the frequent rains of latter winter and early spring as favouring malaria, and speaks of the difficulty of the task of abolishing the thousands of ponds where Anopheles breeds. In the neighbourhood of military posts, however, breeding-places were treated by the various approved methods. Screening of doors and windows was too often rendered futile by negligence and even by deliberate destruction, and quinine prophylaxis was not easy to carry out even under careful supervision.

A. A.

ARMAND-DELILLE (P.), PAISSEAU (G.) & LEMAIRE (H.). **Le paludisme de première invasion observé en Macedoine pendant l'été 1916.**—*Bull. et Mém. Soc. Méd. des Hôpit. de Paris.* 1916. Oct. 26. 3 ser. Vol. 32. No. 27–28. pp 1569–1582. With 8 charts.

The authors consider that from the epidemiological standpoint Macedonia is comparable with a tropical malarious country; there is the same abundance of Anopheles, and the same prevalence of crescents in the blood of the indigenous human carriers.

In the French Macedonian forces, in 1916, the predominant form of malarial fever was subtertian; benign tertian was observed in June, but quartan was exceptional and occurred only in the Algerian quota.

The conspicuous clinical manifestations were not typically malarial, but were rather symptomatic of gastro-intestinal derangement, with a temperature slightly oscillating about 39° C. (102·2° F.) for three or four days, followed by lysis even when quinine had not been given.

The authors comment upon the protean modifications of malarial fever in Macedonia, exemplifying their generalizations by clinical abstracts. The following types are instanced:—The Typhoid, which apart from examination of the blood might be assigned to gastric fever, or to typhoid mollified by vaccination. The Pernicious, characterized by rapid anaemia, the malarial symptoms being obscured. The

Pernicious Apoplectic, sudden in onset, with loss of consciousness, suggestions of hemiplegia, and convulsions. The Pernicious Meningeal, with semi-coma, tetany and convulsions. The Delirious, which may also be associated with the apoplectic and comatose types. The Algid or Choleriform, characterized by all the signs and symptoms of derangement of the suprarenal bodies; this may be an isolated type, or may be connected with any other pernicious type; in one instance it was a complication of benign tertian.

The authors also separate various forms of masked malaria (" larval malaria ") as follows :—Profound anaemia with evanescent oedema. The Haemorrhagic, with purpura, petechial eruptions, ecchymoses and uncontrollable epistaxis. The Icteric, without haemoglobinuria. The Suppressed Adrenal, with vomiting and abdominal pain suggesting appendicitis. The Nervous.

Among complications of malaria the authors observed, fairly often, in grave cachectic cases, a double parotiditis.

The authors, being sufficiently occupied with their investigations in the laboratory, did not concern themselves with treatment and the quinine problem. They state, however, on the authority of M. ABRAMI, that large doses of quinine given at the very outset are necessary to sterilize the blood and to forestall secondary symptoms, and that in pernicious cases large intravenous injections of quinine and adrenalin saved a great number of lives.

A. A.

TRASK (John W.). **Malaria. A Public Health and Economic Problem in the United States.**—*Public Health Rep.* 1916. Dec. 22. Vol. 31. No. 51. pp. 3445–3452. With map.; and *Amer. Jl. Public Health.* 1916. Dec. Vol. 6. No. 12. pp. 1290–1297. With a map.

This is a well-considered exhortation upon the text that wide and exact malarial surveys are essential both to the health and to the commercial prosperity of communities. The following artless words from the mouth of a mill manager are quoted by the author as showing that even the practical man is getting some glimmerings of this matter : " The money spent in anti-malaria work here has paid the quickest and most enormous dividends I have ever seen from any investment, and after having had our experience I would if necessary do the work over again if I knew it would cost ten times the amount."

A. A.

CARTER (H. R.), Le PRINCE (J. A. A.) & GRIFFITTS (T. H. D.). **Impounded Water Surveys in Alabama and South Carolina during 1915 to determine its Effect on Prevalence of Malaria.**—*U.S. Public Health Service. Treasury Dept. Public Health Bull.* No. 79. 1916. Sept. 34 pp. With 3 maps.

This report describes very fully the results of much methodical and discriminative observation. The impounded waters referred to are good-sized sheets of water retained by dams. The objects of the survey were, among other things, to determine the Anopheles fauna and its seasonal specific composition, to investigate its origin, whether carried in by affluent streams or otherwise, to examine generally the conditions of its existence and particularly to watch any biological conditions (e.g., state and distribution of aquatic vegetation, predominance of any specific aquatic plant) that might exert an influence on Anopheles larvae or even on a particular species of larva. The authors of course take note of many other circumstances that are generally known to favour or to check Anopheles larvae, but they consider that the exact study of the influence of the aquatic flora may prove to be important. They also pay attention to the flight of Anopheles and to their specific occurrence in houses. For suggestive ideas the report must be commended to general attention.

A. A.

O'CONNELL (Mathew D.). **The Meteorology of Malaria. Malarial Fevers in England.**—*Jl. Trop. Med. & Hyg.* 1916. Dec. 15. Vol. 19. No. 24. pp. 285–286.

In an antecedent paper [see this *Bulletin*, Vol. 8, p. 33] the author advocated, by rather operose dialectics, the view that the emancipation of England from malaria is due not to the repression of Anopheles, but to the decreased atmospheric humidity that has followed drainage in the malarious tracts. The present paper is another example of the "high *priori*" method.

The author takes it for granted that a high temperature and a high degree of humidity of the atmosphere are together *per se* a cause of pyrexia, and he finds the verification for this assumption in the statistics of the Departmental Committee on Humidity and Ventilation in the Cotton and Linen-Weaving Sheds, and in the incidental observation that his own temperature rose (a rise of from 0·6° to 1·1° Fahr.) on two of three occasions when he entered an artificially heated and moistened glasshouse. It would have been more satisfactory to have tested it by observations of residents in tropical plains during the fine intervals of the rainy season, or even by observing the extraordinary fluctuations of body-temperature that take place during the ordinary working-day of an ordinary medical man [the reviewer has made such observations of himself] at any season.

In this paper the author by study of the meteorological records of Greenwich for the month of August, 1843, in comparison with the Departmental statistics quoted above, is satisfied that these records can be resolved into definite periods when the meteorological conditions at Greenwich were such as would cause pyrexia, and definite intermissions when they would not these periodic fluctuations synchronising with simple malarial types. The next step is to suggest a possible connection between these computations and the statement that malarial fevers were quite common in England prior to the year 1853. Were these malarial fevers, the author asks, caused by atmospheric conditions such as those prevalent at Greenwich in August, 1843?

A. A.

PAISSEAU (G.) & LEMAIRE (H.). **Accès pernicieux palustres et surrénalites aiguës.**—*Bull. et Mém. Soc. Méd. des Hôpit. de Paris.* 1916. Oct. 26. 3 ser. Vol. 32. No. 27–28. pp. 1530–1545.

While far from contending that all acute pernicious developments of malaria are connected with pathological changes in the suprarenal bodies the authors consider that a particular concurrence of symptoms, commonly found in algid or asthenic cases, is a distinctive indication of suprarenal insufficiency. The coincident symptoms are vomiting, diarrhoea, epigastric and lumbar pains, asthenia, the phenomenon of the white line, and above all an arterial tension so effete that the least pressure obliterates the pulse. The signal symptom—exhausted arterial tension unaccompanied by any change in the rhythm of the heart—though usually associated with algid symptoms, may also appear in the other types of pernicious malaria.

An abstract of the authors' opinions has already been summarized in this *Bulletin* [Vol. 9, pp. 72–3]; in the paper at present under reference their theorem is elaborated and the post-mortem and other evidence in support of it is given in very ample and precise detail.

A. A.

PAISSEAU & LEMAIRE. **De l'insuffisance surrénale dans le paludisme.** —*Presse Méd.* 1916. Dec. 4. Vol. 24. No. 67. pp. 545-547.

Here the authors present in a condensed and systematised form their generalisations on the subject of renal insufficiency in malaria. They define (see above) an adrenal complication or nexus (*syndrome surrénal*) of frequent occurrence in malarial cases; and this syndroma either may be so tumultuous as often to overwhelm the normal onset of the disease, or may issue, sometimes gradually, sometimes rapidly, from the ordinary symptoms. In the sudden and acute cases the authors consider that their conclusions are well supported by post-mortem evidence.

Of the sudden (*suraigu*) concourse of adrenal symptoms three varieties are discriminated; the comatose, the algid or asthenic, and the choleriform.

In the comatose cases a man on duty, or a wounded man, falls insensible without any warning; his pulse is found to be incredibly soft; his temperature, risen at the outset to 40° C., falls in a few hours below normal, and death soon supervenes.

In the asthenic cases, perhaps, an ordinary malarial paroxysm culminates in a very high temperature, delirium and other nervous troubles, and intractable vomiting; suddenly the temperature drops below normal, diarrhoea occurs, and the patient collapses.

The choleriform variety begins with profuse diarrhoea, intense cramps, and incessant vomiting; here the parasitism of the blood is extreme.

In all these cases of sudden adrenal insufficiency post-mortem examination discloses characteristic lesions of the suprarenal bodies; sometimes the cortex is grey and the medulla white, and there is cellular degeneration in every part; at other times the colour of the whole organ is reddish grey, and there are many minute haemorrhages and thromboses.

Acute adrenal symptoms occur in malarial cases several weeks from infection. After persistent malaise, headache, and anaemia there is a sudden rise of temperature, with vomiting, diarrhoea, and lumbo-abdominal pains, followed by a sudden fall of temperature below normal. The heart and liver are normal, but the spleen is enlarged and arterial tension is reduced. In a fatal case the same degenerative changes were found in the supra-renal bodies.

Subacute adrenal insufficiency has a gradual origin in an ordinary case. The symptoms are, anaemia, anorexia and nausea, asthenia, diminished arterial tension, and often lumbar pain. Subacute cases may continue into a chronic stage, of which general pigmentation is one of the results (*syndrome addisonien*). No post-mortem verification of the adrenal hypothesis has occurred, so far, in these subacute and chronic cases.

The authors express the opinion that derangement of the supra-renal bodies explains a group of concurrent symptoms—diminished arterial tension, asthenia, gastro-intestinal troubles, and lumbo-abdominal pains—that are almost classical in malaria; and they suggest that in the treatment of all grave cases of malaria adrenalin should be as familiar as quinine.

A. A.

PAISSEAU (G.) & LEMAIRE (H.). **Syndromes hémorragiques dans le paludisme primaire.**—*Bull. et Mém. Soc. Méd. des Hôpit. de Paris.* 1916. Oct. 26. 3 ser. Vol. 32. No. 27–28. pp. 1672–1685.

In the course of their study of malarial anaemia the authors have observed *inter alia* early haemorrhagic complications occurring between the first week and the second month after primary infection. They have met with cases of simple purpura, manifested in fine petechiae all over the body but particularly abundant on the legs, and characterised by a complete absence of pyrexia; of simple purpura shown in extensive ecchymoses and associated with ordinary "pernicious" symptoms; of haemorrhagic or haemophilic purpura, where the cutaneous ecchymoses are quite overshadowed by haemorrhages from the mucosae and particularly epistaxis, and the peripheral blood contains many immature elements and basophil multi-nuclears; of haemoglobinuric purpura, in which, besides petechiae and ecchymoses and epistaxis and bleeding from the gums, haemoglobinuria was a conspicuous symptom only four days after the initial paroxysm of a primary infection; and of pernicious subicteric anaemia, where within 23 days of the initial (and probably primary) infection, extremely severe epistaxis, concurrent with ecchymoses and petechiae, were prominent symptoms of a progressive anaemia that ended fatally within a month. The authors give clinical extracts of typical instances of all these forms of what they designate primary malarial haemorrhagic syndromata, along with statements of blood-counts in specific detail. In all cases the genetic malarial connection was confirmed by examination of the blood.

A. A.

MONIER-VINARD, PAISSEAU & LEMAIRE (H.). **Cytologie du liquide céphalo-rachidien au cours de l'accès palustre.**—*Bull. et Mém. Soc. Méd. des Hôpit. de Paris.* 1916. Oct. 26. 3 ser. Vol. 32. No. 27–28. pp. 1607–1610.

The authors discovered in 23 out of 33 cases of malarial fever taken at random a characteristic cytosis (and also an increase of albumin) in the cerebrospinal fluid withdrawn by lumbar puncture and centrifugated. Eighteen were cases of simple malarial paroxysm; in three of these the fluid contained abundant lymphocytes, some small uninuclears, and some endothelial cells; in six it contained a few lymphocytes and uninuclears; in nine a few lymphocytes and sometimes occasional endothelial cells.

Five were cases of pernicious malaria, marked by coma passing into an algid state, paroxysmal convulsions, and other grave meningeal symptoms; in two of these cases that terminated fatally the fluid contained floccules of fibrin and the centrifugated clot was composed of lymphocytes and a few multinuclears; in three cases that recovered there was a varying amount of lymphocytosis in two, and only abundance of endothelial cells in the third.

The authors conclude that there is a localized meningitis in malaria, with after-possibilities of damage to the nervous system.

A. A.

WEYDEMANN (H.). **Drei Malariafälle im Heimatslazarett.** [Three Cases of Malaria in a German Hospital.]—*Zeitschr. f. Aerztl. Fortbildung.* 1916. Nov. 15. Vol. 13. No. 22. pp. 608–609. With 1 chart.

A critical account of three typical cases of malaria—one tertian, two double tertian—occurring in men convalescent from wounds in the hospital at Frohnau. The wounded men had been admitted in September, October and November, and the respective attacks of malaria followed in April, May and June. All three had the same antecedents; they had never lived in a malarious country and had never before suffered from malaria; before admission they had been on active service in Russia, where they had not heard that any of their comrades had fever or even that any were being treated with quinine. As neither Anopheles nor malaria are known in the country round about Frohnau, or have been heard of there for the last twenty years, they could not have acquired malaria after their admission. If, as seems the residual explanation, malaria is endemic in the part of Russia where they served and they were infected there, then the long latent period is remarkable.

A. A.

JOB (E.) & HIRTZMANN (L.). **Un mode d'administration de la quinine dans le paludisme.** –*Arch. Méd. et Pharm. Milit.* 1916. Oct. Vol. 66. No. 4. pp. 461-465.

From an experience of 2½ years in Morocco the authors advocate the use of quinine in repeated small doses. So given it is, in their experience, not only better absorbed, and so more effective in its action upon the malaria parasites, but also is unlikely to produce symptoms of cinchonism. The only drawback is that it is more exacting for the physician. The dose recommended is 0·25 gm. of the hydrochlorate. In an ordinary case six such doses (totalling 1·50 gm.) are given daily on six days of the first week and on five days of the second week, and four such doses (totalling 1 gm.) on four days of the third week and on three days of the fourth week.

A. A.

von STEJSKAL (Karl Ritter). **Ueber intravenöse Chinininjektion bei Malaria.**—*Wien. Klin. Woch.* 1916. Sept. 14. Vol. 29. No. 37. p. 1174.

As the result of his experience of 50 cases the author considers that the best moment for the injection is when the temperature is beginning to rise, and that the best preparation is the bihydrochloride as it does not cause necrosis. The author has never observed quinine-resistance in malaria parasites, if by that term it be meant that the severity and the frequency of the attacks are not at all influenced by quinine.

A. A.

TELANG (R. H.). **Quinoidine.** [Correspondence].—*Indian Med. Gaz.* 1916. Dec. Vol. 51. No. 12. pp. 474–475.

The writer has been using quinoidine for the last three years, making it up into pills (containing 2¼ grains) with an equal weight of a mixture of equal parts of starch and Mag. Carb., and administering from four to eight such pills daily. He finds that quinoidine in some cases is better than quinine, that it does not cause cinchonism, and that it has a slightly laxative effect.

A. A.

LACKMANN (Theodor) & WIESE (Otto). **Ueber Optochin bei Malaria tertiana.**—*München. Med. Woch.* 1916. Oct. 10. Vol. 63. No. 41. pp. 1463-1464. With 6 charts.

Optochin is stated by the authors to be hydrochloride of ethylhydrocuprein, cuprein apparently being here a synthetic equivalent of the alkaloid of Cuprea bark.

It was administered in some cases of tertian malaria in the following manner:- 0·2 gm. every two hours from 8 a.m. to 4 p.m. (or from 10 a.m. to 6 p.m.) daily for seven days; then a cessation for five days; then a course of optochin as before for two days; then another cessation for five days; and so on for several weeks.

Six charts showing temperature-curve and effect on malaria parasites are given to illustrate the results of six cases so treated. They show that (except in one case, where the effect was not quite so immediate) the temperature dropped from points varying from 1¼° to about 4° above normal to a point about 1° below normal the day following the first exhibition of optochin, and (except in one case) remained steadily at the below normal point for the rest of the time (six to nine days) included in the charts, and that the parasites disappeared from the blood on the second or third day following the first exhibition of optochin.

The authors make bare mention of 14 other cases in which the results were equally good.

No ill effects of any kind were observed in any case, except one in which for a few hours there was slight buzzing in the ears.

A. A.

STEIN (Benno). **Malariaparasiten und Neosalvarsan.**—*Wien. Klin. Woch.* 1916. Aug. 24. Vol. 29. No. 34. pp. 1071–1072.

Observations on the effect of salvarsan on malaria parasites in a single case of [? benign] tertian. The patient had been treated with quinine to begin with, and after an intravenous injection of 0·6 gm. of neosalvarsan five examinations of the blood were made at short intervals during the following eight hours. These observations, which are reported in meticulous detail, showed that in many of the parasites, but particularly in the young ring-forms, the protoplasm became disorganised, indistinct, and indifferent to stains.

A. A.

ROGERS (Leonard). **Disappearance of Malignant Tertian Crescents from the Blood following the Intravenous Injection of Tartar Emetic.**—*Brit. Med. Jl.* 1917. Jan. 6. pp. 6–8.

A short account of two cases of subtertian malaria with crescents very numerous, in which the writer tried the experiment of injecting tartar emetic intravenously. In one case from the 9th to the 14th day (when the patient left Calcutta) after a single injection of 8 cgm. no crescents could be found. In the other case on the 5th to the 8th days after a *second* injection of a similar quantity no crescents could be found.

From some clinical observations by the author and Captain HUME, independently, on the influence of tartar emetic in benign tertian, the author is inclined to think that this drug is less effective than quinine against the intracorpuscular stages of the parasite, and is disposed to suggest that quinine should be used to check malarial paroxysms and afterwards tartar emetic (intravenously) to destroy the extracorpuscular stages and so both to prevent relapses and to render the patient less infective to mosquitoes.

With his usual moderation the author deprecates an exaggerated estimate of the results of two cases, but justifies the publication of the results as a rational invitation to other investigators.

A. A.

ROSS (Ronald). **Tartar Emetic and Malaria.** [Correspondence].—*Brit. Med. Jl.* 1917. Jan. 27. p. 136.

The writer finds corroboration of ROGERS's opinion that tartar emetic does not affect non-sexual forms of malarial parasites in a case, reported by JACKSON, where a kala azar patient after prolonged intravenous treatment with that drug developed a mild form of tertian and had to be treated independently with quinine.

He recommends that a special malaria ward be instituted somewhere for the purpose of prolonged investigation, by exact enumerations, of the action of antimony, and incidentally of cinchona alkaloids other than quinine, and also of quinine itself in intramuscular injections.

A. A.

JOHNS (Foster M.). **The Centrifuge Concentration of Malaria Plasmodia for Diagnostic Purposes.**—*New Orleans Med. & Surg. Jl.* 1916. June. Vol. 68. No. 12. pp. 765–767.

The method is recommended for obscure and chronic cases in which parasites cannot be found by ordinary methods. Briefly the procedure is as follows :—

Draw 10 cc. of blood.

Add 0·2 cc. of a 50 per cent. dextrose solution to prevent changes in parasites.

Defibrinate, or add 0·2 cc. of a 50 per cent. solution of sodium citrate to prevent coagulation. [If sodium citrate be used, the blood platelets might confuse one who is not an expert.]

Centrifuge until the cells are completely separated from the plasma, with the leucocytes in the surface layers. The parasites rise with the leucocytes.

Skim off the leucocyte layers, and centrifuge them in a smaller tube as before.

Draw off this leucocyte layer for films.

It is claimed that in the best preparations the parasites are concentrated about 900 times, and that as many parasites should be seen in one minute as in fifteen hours examination of ordinary films of the same blood. Very small parasites are not concentrated to the same extent however.

A. A.

ZWEIG (Walter). **Das Verhalten der mononukleären Leukozyten bei der Malaria.** [The Uninuclear Leucocytes in Malaria.]—*Wien. Klin. Woch.* 1916. Oct. 19. Vol. 29. No. 42. pp. 1328–1329. With 3 figs.

The authors describe various changes seen in the uninuclear leucocytes in malarial blood—changes that occur independent of quinine therapy.

The uninuclears become very numerous ; they may become enlarged, or distorted, or they may throw out long filaments of cytoplasm, or buds ; they become vacuolated, or may contain pigment granules, and the nucleus may be displaced or may divide curiously. The authors are of opinion that these changes are something novel, and that they throw a light on the deep-seated alterations in blood-formation that may occur in malaria patients.

There are a dozen text-figures, some of them rather weird ; one of them, exhibiting a displaced nucleus and a well-defined "nuclear-remnant" (*Kernreste*), looks like a poor representation of a phagocyte which has ingested a full-grown schizont that is on the point of dividing.

A. A.

MUEHLENS (P.). **Ueber Malariagefahren und ihre Verhütung durch Chininprophylaxe und Chininbehandlung.** [On Malaria-Carriers and their Preclusion by Quinine Prophylaxis and Quinine Treatment.]—*München. Med. Woch.* 1916. Sept. 26. Vol. 63. No. 39. pp. 1398–1399.

According to the author most parts of Germany—the north-western parts of the country, the mouths of the Oder and Weichsel, and the neighbourhood of Leipzig are exceptions—are free from endemic and epidemic malaria, though Anopheles mosquitoes are plentiful. The German troops however are now much in contact with malaria, not only in the Balkans and in Turkey, but also on the west and east fronts ;

and the purpose of this paper is to draw attention to the danger of re-infection of Germany by soldiers going on leave, and still more by soldiers returning home after the war. The author uses iteration of the kind forcibly stigmatised by Falstaff in peremptorily enjoining regular quinine prophylaxis and the vigorous after-treatment of all cases of malaria, which must not be permitted to leave the medical officers' hands until they are assuredly free of parasites.

A. A.

HARFORD (C. F.). **Quinine as a Prophylactic.**—*Trans. Soc. Trop. Med. & Hyg.* 1916. Dec. Vol. 10. No. 2. pp. 43–44.

A temperate and judicious criticism of one of the main theses of Dr. A. MACDONALD'S paper in the *Transactions of the Society of Tropical Medicine and Hygiene* for November, 1916 [see this *Bulletin*, Vol. 9, p. 77]. It is pointed out that in the prevention of malaria quinine is recognised as a most useful auxiliary by some of the most strenuous supporters of the sanitary policy of eliminating mosquitoes both by direct effort and by education of the proletariate; and that the attribution of ill effects to prophylactic doses of quinine is not generally justified. Particularly is the allusion to blackwater fever deprecated, the author being of opinion that in West Africa the restriction of this malady is largely due to quinine prophylaxis. The author concludes with an emphatic approval of a daily dose of 5 grains of quinine for Europeans in tropical Africa, while at the same time firmly endorsing Dr. MACDONALD'S advocacy of the establishment in every colony of a sanitary staff concerned with preventive measures of a wider and more enduring kind.

A. A.

BRIGNONE (Emiliano). **La malaria in Terranova Monferrato durante il quadriennio 1912-1915 con speciale menzione alla propaganda e profilassi antimalarica scolastica dell' anno 1915.** [The Anti-malarial Campaign in Terranova Monferrato for the Four Years 1912-1915.]—*Malariologia.* 1916. Dec. 31. Ser. 2 Year 2. No. 6. pp. 145–163.

An account of the progress of the anti-malarial campaign in the above district, which is situated on the left bank of the river Po, in Italy. The following table shows the amount of quinine distributed and the number of cases of malaria, for the 12 years 1904–1915 inclusive:—

	Grammes of Quinine.	Cases of Malaria.
1904	1,100	123
1905	3,470	109
1906	5,040	87
1907	5,664	68
1908	9,548	53
1909	10,360	34
1910	11,640	17
1911	12,476	9
1912	13,654	14
1913	12,278	11
1914	12,524	9
1915	13,132	7

The author considers himself justified by these figures in suspending for the future wholesale quinine-prophylaxis of families, confining himself instead to the treatment of school children. For this purpose 2,524 grammes of quinine were distributed in chocolate tablets amongst 285 school children in the year 1915. It will be seen by the figures that the district was but a small one.

J. B. Nias.

ORTA (Francesco). **Lo stato attuale della malaria in provincia di Ferrara.** [The Present Condition of Malaria in the Province of Ferrara.]—*Malariologia.* 1916. Dec. 31. Ser. 2. Year 2. No. 6. pp. 164–171. With 4 figs.

A short paper pointing out that a badly managed system of drainage works in a malarial district often leaves many stagnant collections of water, in which mosquitoes can breed at their pleasure. In summer time, in order to economize coal, the pumping of water from the drains into the main canal of such systems is often stopped because it is considered unnecessary, or perhaps undesirable, to drain the adjacent subsoil quite dry. The residues of stagnant water in these half-dry canals are then, of course, as available for the breeding of mosquitoes as any natural pond. In this way may be explained the failure of many well planned drainage systems to produce any substantial diminution in the amount of malaria in a district. The paper is accompanied by four well-chosen photographs illustrating such conditions.

J. B. N.

di PACE (Ignazio). **A proposito della Malaria da sterri. Problemi di malariologia.** [Malaria and Reclamation Works. A Problem in Malariology].—*Malariologia.* 1916. Feb. 29, April 30, June 3. Aug. 31, Oct. 31. Dec. 31.; Ser. 1. Year 9; Nos. 1, 2, 3, 4, 5, 6; pp. 23–37; 57–63; 80–91; 103–115; 134–141; 171–180.

The author of this paper develops, in a rather prolix and uninteresting manner, a theory still much in vogue with a certain school of Italian epidemiologists, namely, that there is a third and hitherto unidentified element in the spread of malaria in addition to man and the mosquito. The author bases his argument chiefly on what happened in certain small areas of reclamation-work in Italy with which he was personally familiar, and does not look much beyond this narrow circle of facts. Those who are interested in the argument of a *tertium quid* in the spread of malaria would do well to look at the original paper.

J. B. N.

GONZÁLES RINCONES (R.). **Presentación de dos anofelinos capturados en Aragua por el doctor Núñez Tovar.** [Note on Two Anophelines taken in Aragua (Venezuela) by Dr. Núñez Tovar.]—*Gaceta Med. de Caracas.* 1916. Nov. 30. Vol. 23. No. 22. pp. 171–172.

The author records the identification of two new Venezuelan species of mosquito, both capable of transmitting malaria. The first is a new sub-species of *Cellia*, distinguishable from *argyrotarsis* and *albimana* by having the posterior tarsi ringed with pure white. Only one specimen, a female, was taken. The second is *Anopheles crucians* Wiedemann, not hitherto recorded from Venezuela. This brings up the number of known species of malaria-transmitting mosquitoes in Venezuela to four, the other two being *C. argyrotarsis* and *C. albimana.*

J. B. N.

JNANENDRA NATH DUTT. **Adulteration of Quinine.** [Correspondence].—*Indian Med. Gaz.* 1916. Dec. Vol. 51. No. 12. p. 474.

The writer states that in some up-country bazárs quinine adulterated with some white substance that effervesces when treated with an acid is being sold under a counterfeit label, and he suggests that this sort of thing may have something to do with the vulgar loss of faith in quinine.

A. A.

BERIBERI AND POLYNEURITIS AVIUM.

VEDDER (Edward B.). **The Known and the Unknown with regard to the Etiology and Prevention of Beri-beri.**—*Milit. Surgeon.* 1916. Oct. Vol. 39. No. 4. pp. 368–379.

The author read a paper on this subject before the second Pan-American Scientific Congress which, though of great interest, contains no new facts. He states that it is of the utmost scientific interest to solve the following problems.

(1) The relationship between wet and dry beriberi; are these two types of the disease caused by a deficiency of the same vitamines ?

(2) What is the physiological action of the vitamines; are they indispensable building stones for certain tissues (necessary for the building up of nervous tissues, as believed by the author) or are they concerned in some other manner as in carbohydrate metabolism ?

(3) What is the chemistry of the vitamines ?

The elucidation of the first point is now more possible, for ROMMEL and VEDDER have found that pigs suffer from wet beriberi, as distinct from the dry form found in birds [see this *Bulletin*, Vol. 7, p. 374].

P. W. Bassett-Smith.

VEDDER (Edward B.). **The Relation of Diet to Beriberi and the Present Status of our Knowledge of the Vitamins.**—*Jl. Amer. Med. Assoc.* 1916. Nov. 18. Vol. 67. No. 21. pp. 1494–1497.

In this most interesting paper the author gives a concise account of how the deficiency theory of beriberi was evolved from careful experimental observations mostly made on birds, but later on man himself, and how certain substances which were separated from foods became recognised and were called vitamines by FUNK. These were found by many other workers also to be necessary factors for the prevention and cure of the disease and finally there was strong evidence to show that there were various forms of vitamines, each practically specific, for beriberi and other conditions, such as scurvy and probably pellagra. A great step forward was made when WILLIAMS [unpublished work] was able to produce these bodies synthetically, closely allied to and isomeric with the hydroxypyridins and found in yeast as adenin. The exact rôle that these vitamines play in metabolism has not yet been clearly made out but, as the author has stated previously, he thinks that the anti-neuritic vitamine acts as a building stone of the complex structure of the nervous tissue. When there is a deficiency of this vitamine the nervous tissue becomes first exhausted, and then degenerated, producing in birds polyneuritis and in man dry beriberi. He does not believe in the theory put forth by BRADDON and COOPER that the vitamine is concerned in the carbohydrate metabolism or that with a deficiency of vitamine the larger supply of carbohydrates ingested the more quickly will the neuritis appear. On this question he proposes shortly to publish further experimental evidence. He again emphasises the fact that beriberi in man is not only dependent on rice, but is produced by deficiency when various other foods are the staple diet: white flour, canned foods, etc. Attention is drawn to the work of JURGENS on a disease found in prison camps in Europe, called "the oedema disease," which is probably wet beriberi.

That pellagra is a deficiency disease he is firmly convinced and his reasons for coming to this conclusion are given. Finally the author lays down a number of simple dietary rules for the prevention of deficiency disease, which are sufficiently important to be quoted in extenso.

"1. In any institution where bread is the staple article of diet, it should be made from whole wheat flour.

"2. When rice is used in any quantity, the brown undermilled, or so called hygienic rice, should be furnished.

"3. Beans, peas or other legumes, known to prevent beriberi, should be served at least once a week. Canned beans or peas should not be used.

"4. Some fresh vegetable or fruit should be issued at least once a week and preferably at least twice a week.

"5. Barley, a known preventive of beriberi, should be used in all soups.

"6. If cornmeal is the staple of diet, it should be yellow meal or water-ground meal, that is, made from the whole grain.

"7. White potatoes and fresh meat, known preventives of beriberi and scurvy, should be served at least once a week, and preferably once daily.

"8. The too exclusive use of canned goods must be carefully avoided."

P. W. B-S.

HEISER (Victor G.). **Memorandum with Respect of Beriberi in the Orient.**—4 pp. 1915. Sept. 30. New York. [The Rockefeller Foundation].

This note contains nothing new, but the author does useful work in drawing attention to the little good that is being done by leaving the preventive measures against beriberi to the education of the people eating rice, and manufacturers preparing the grain; the only effective method being concerted international action and the placing of a small tax on over-milled rice if the disease is to be abolished from rice-eating countries.

P. W. B-S.

DIETERLEN. **Ueber eine im Jahre 1914 in der Südsee beobachtete Beriberi-Epidemie.** [An Epidemic in the South Sea seen in 1914.] —*Arch. f. Schiffs- u. Trop.-Hyg.* 1916. July. Vol. 20. No. 13. pp. 306–311.

The epidemic occurred among the Melanesian natives in New Mecklenburg, an island of the Bismarck Archipelago. These were almost exclusively fed on polished rice but on account of the war the last rice was issued about the middle of August and after this the men lived on sago and cocoa nuts. The first case was observed in August. The disease was mostly of the atrophic-paralytic type, and there were only two deaths. Condensed milk, cocoa, fresh fish, fruit, taro, and sweet potatoes were provided as extra food and the epidemic died out in November. During the first half of October there were as many as five fresh cases daily.

P. W. B-S.

FINDLAY (G. Marshall). **Beriberi.**—*Practitioner*. 1917. Jan. Vol. 98. No. 1. pp. 69–78.

This article is founded on 36 cases of beriberi which have occurred in H.M. ships employed in the Persian Gulf, Indian Ocean, Red Sea, and Suez Canal zones. The patients were Europeans, Indians, and Chinese. A good description of so called ship-beriberi is given with details of some of the cases. In the majority the cause could not be put down to the consumption of rice, but a deficiency in vitamines was generally easily demonstrated by an analysis of the diet taken. Predisposing causes dependant on temperature and humidity also play an important part. Clinically oedema of the legs is almost always present, and in half the cases it was found over the sternum, cheek bones, and forearms. In some instances attacks of syncope were noticed and anaemia is common, the red cells falling to 3,500,000 per cmm., while the leucocyte count is increased. For treatment the use of yeast in some form is strongly advocated.

P. W. B-S.

FINDLAY (G. Marshall). **Note on a Case of Beriberi.**—*Lancet*. 1916. Oct. 7. pp. 646–647.

The history given is that of a Naval rating aged 23, who spent the greater part of the last five years in the Persian Gulf and India. After seven months of perfect health in September, 1911, he complained of weakness and swelling of the legs, which disappeared after three weeks' treatment. The following year he contracted malaria and in June, 1912 the symptoms returned plus cardiac signs and loss of deep reflexes. Most of 1913 was spent at Colombo and he had no relapse. In 1914 while at sea there was a slight return of symptoms but in September 1915 there was again a severe relapse with all the cardinal symptoms. The patient was well nourished but anemic. There were no cases of beriberi among his ship mates and the only possible causative factor noted was that this man during the seven months previous to his first attack never took fresh meat. This defect was afterwards remedied but without preventing recurrences of the attacks. There were in the five years four attacks with gradually increasing debility.

[VEDDER quotes a case of undoubted beriberi in a ship's officer, who had taken a most varied and satisfactory diet, except that for the previous four months everything he had eaten had been canned.]

P. W. B-S.

REED (Alfred C.). **Beriberi. Report of Cases.**—*Jl. Amer. Med. Assoc.* 1917. Jan. 13. Vol. 68. No. 2. pp. 116–118.

The author describes two cases of disease in which the diagnosis of beriberi was made, but in neither was the course typical and other pathological conditions were present. Case one, that of a Japanese, aged 44, for twelve years a resident in the United States. Cardiac palpitation and hypertrophy with pretibial oedema and symptoms of peripheral neuritis were present, but signs of renal insufficiency, alveolar pyorrhoea, and a Clonorchis infection were found. In case two the patient was a Chinaman who had been in the United States for thirteen years. At the clinic, a diagnosis of peripheral neuritis was made, possibly beriberi (though the knee jerks were exaggerated). There was some slight irregularity of the cardiac rhythm and pretibial oedema. A Trichocephalus infection with pyorrhoea and latent tuberculosis was also present.

P. W. B-S.

REINHARD (Paul). **Röntgenbefunde bei beriberiartigen Erkrankungen.** [Röntgen Ray Appearances in Beriberic Affections.]—*Arch. f. Schiffs u. Trop.-Hyg.* 1916. Jan. Vol. 20. No. 1. pp. 1–11. With 3 plates and 13 text figs.

The author has examined orthodiagramatically by X-rays six patients in the standing position to show the alteration of the cardiac shadows found in beriberi. He arrived at the following conclusions. In beriberi the pulmonary vessels and the right side of the heart are first enlarged, and later the left side becomes affected. When convalescence begins, first the left side clears up, then the right side and finally the pulmonary vessels resume their normal characters. Sketches and radiograms are given to show his methods and results.

P. W. B-S.

GIBSON (R. B.) & CONCEPCIÓN (Isabelo). **The Influence of Fresh and Autoclaved Cows' Milk on the Development of Neuritis in Animals.** —*Philippine Jl. Sci.* Sec. B. Trop. Med. 1916. May. Vol. 11 No. 3. pp. 119–131. With 2 plates and 2 figs.

The value of milk for supplying vitamines to growing organisms, and information as to whether these are easily destroyed by heat are points of very great interest not only in the Philippines where infantile beriberi is so common, but to all concerned in the development of children. It has long been believed that boiled milk is a predisposing cause of rickets and scurvy-like symptoms, and much experimental evidence has been brought forward to demonstrate the harmfulness of heating the milk and devitalising it. The vitamines themselves are known to be destroyed by heat, those for scurvy at a lower temperature than those for beriberi. The authors have attempted to determine what amount of antineuritic substances are present in milk and how these are affected by autoclaving the milk at 120° C. for two hours. Experiments were carried out with fowls, dogs and pigs.

Three fowls were fed on 40 grams of polished rice and 100 cc. of fresh cow's milk daily, and three with rice and a similar quantity of autoclaved milk. Both sets developed mild polyneuritis about the usual time but did not lose weight. Post-mortem, the sciatic nerves showed degenerative changes. In a second experiment 200 cc. of milk and 10 grams of rice were given daily and none of these fowls developed neuritis and no degenerative changes in the nerves were found. Five puppies, 12 days old, were then used, three being fed on autoclaved milk and two on fresh cow's milk. On the 89th day the dogs were undersized and partially aphonic; they were killed on the 92nd day. No scorbutic symptoms were shown by any of the animals, but those fed on the autoclaved milk lost weight rather more than the other two. Post-mortem, no gross changes, endocrinal glands normal, degenerative changes in sciatic nerves of all.

Six 17 day old pigs were then experimented with. The gain in weight was practically identical in each. On the 34th day all appeared normal, and two were then killed. Post-mortem, early changes of degeneration were found in the sciatic nerve, more marked in the one fed on fresh milk than in the pig having autoclaved milk. On the 56th day all the remaining four had developed marked oedema, and on the 60th day two more were killed. Post-mortem showed no signs of scurvy, the endocrine glands were normal but the sciatic and pneumogastric nerves were degenerated. The two remaining pigs continued to gain weight but oedema and aphonia remained. One died suddenly on the 74th day and one on the 106th day. Nerve degenerations were present and, in both, a rupture of the anterior coronary artery had occurred.

These experiments show that " the anti-neuritic vitamine is present in milk in slight amount only, and that continued feeding on either fresh or autoclaved milk to animals without suitable addition to the diet, induces certain beriberi symptoms, degeneration of nerves, oedema, and aphonia." No signs of scurvy were found and no evidence was given that autoclaving milk for two hours at 120° C. had affected its nutritive value. From this they reason that as the antineuritic powers of milk are so slight, infants should be given mixed diets as soon as possible. Each child of a *healthy* mother has a reserve supply to draw on until such time as it is normally able to take other foodstuffs than milk. [This would also apply to patients restricted to milk diet for long periods. The vitamine content and nutritive value of milk for its own species is not accurately comparable to the feeding of an animal on milk derived from other species.]

P. W. B-S.

McCollum (E. V.) & Davis (Marguerite). **The Nature of the Dietary Deficiencies of Rice.**—*Jl. Biol. Chem.* 1915. Nov. Vol. 23. No. 1. pp. 181–230. With 42 charts.

In this very interesting paper the authors develop the theory that for the normal growth of animals there are two accessory substances that are required to be added to a rice diet, namely a water soluble substance which is thermostable and soluble in alcohol, and a fat soluble substance [see this *Bulletin*, Vol. 8, p. 465, for summary of a later paper]. A very large number of feeding experiments on rats were carried out to determine the quantities of these accessory substances in various food-stuffs and the amounts that were required of each, the experiments in some cases extending over more than one generation of the animals and being therefore very thorough. They proved that the want of salts was not the cause of the failure in growth and also that rice, up to 80–90 per cent. of the food mixture, in itself did not contain any property that was harmful to the animals. Lactose, especially commercial kinds of unknown purity, when added to rations of polished rice supplemented with purified foodstuffs (casein, butter fat, salts and dextrin) was found to cause considerable improvement in the growth of rats over those on similar diet without the lactose. The most efficient substances containing both the water soluble and fat soluble substance are wheat embryo and other cereal embryos. Desiccated egg-yolk also contains both fat and water soluble accessories but a ration with 5 per cent. of egg-yolk is not sufficient alone to induce growth, too little of the water soluble substances being contained in it. If 10 grms. per cent. of ration of lactose is added to supplement this deficiency, good growth takes place. Skim milk powder is rich in the water soluble accessory. It was found that a ration with as low a percentage of protein as 10 was able to support vigorous growth when supplemented equally by one of the growth promoting fats (wheat embryo and butter fat) and an inorganic salt mixture.

Polished rice and salts together with sufficient wheat embryo to supply liberal protein and water soluble accessory does not support growth, for it does not contain a sufficiency of the fat soluble accessory. This must be added before growth can proceed; likewise 20 per cent. of butter fat alone added to the ration without addition of the water soluble factor will fail to promote growth.

Numerous charts are given to show the curves of growth in the different experiments.

P. W. B-S.

STEPP (W.). **Ist die durch Lipoidhunger bedingte Ernährungskrankheit identisch mit Beriberi?** [Is the Food Disease caused by Lipoid Starvation Identical with Beriberi?]—*Zeitschr. f. Biol.* 1915. Vol. 66. New Ser. Vol. 48. pp. 339–349.

The author carried out a large number of carefully planned feeding experiments to determine the value of accessory substances, such as vitamines and lipoids, in a diet and whether one could replace the other. Mice were the animals used. The experiments are divided into three groups. (1) Lipoid-free food plus vitamines. (2) Vitamine-free food plus lipoid. (3) Controls. It must be understood that lipoid-free does not signify that the food has also been deprived of all its vitamine, for dog biscuit after being repeatedly extracted with 90 per cent. alcohol is only partially freed from its vitamine, but almost all of its lipoids have been extracted.

The substances used were polished rice (vitamine-free); a rice extract containing a high percentage of vitamine, prepared at Basil and called Orypan; dog biscuit, which normally is a perfect food for mice; dog biscuit extracted with alcohol (lipoid-free); alcoholic extract of egg-yolk (lipoid); and salt mixtures.

(1) Animals on lipoid-free food plus vitamine; all the animals died. Controls were made using:—

(*a*) Dog biscuit extracted with alcohol plus salt mixture (no lipoid); all died.

(*b*) Dog biscuit extracted with alcohol, salt mixture, and alcoholic extract of egg-yolk (lipoid); all lived; here both vitamine and lipoid were present.

(2) Animals on vitamine-free food plus lipoid; all the animals died after three or four weeks. The controls were:—

(*a*) Animals fed on polished rice only; death in 3½ weeks.

(*b*) Polished rice, salt mixture, and orypan (vitamine plus lipoid); all but one of the animals recovered.

The experiments clearly indicate that a highly efficient food, as unhusked rice, through the removal of vitamine by polishing will become inefficient, and only by an addition of vitamine can it be made again sufficient, not by the addition of any other accessory substance as lipoid. This lipoid-free food, which contains a small quantity of vitamine also, can only be rendered efficient by the addition of lipoids. Both vitamine and lipoid are required for normal metabolism and neither can replace the other.

P. W. B-S.

FUNK (Casimir). **The Influence of Radium Emanation on the Activity of Vitamine.**—*Proc. Soc. Experim. Biol. & Med.* 1916. Vol. 14. No. 1. pp. 9–10.

Experiments were carried out to see if by means of Radium emanation differentiation between the vitamines which cure beriberi and those that influence growth in young rats could be made, and whether such unstable substances as vitamines would become inactivated by the emanation. Autolized yeast was used for the experiments, administered by intramuscular injections into pigeons which had developed polyneuritis by feeding on white rice. The action of the yeast which had been exposed to the emanations did not differ from that which had not been so treated, and incidentally it was proved that the radium had no destroying action on the vitamines, neither did the emanation have any detrimental action on the vitamines which stimulate growth. A further set of experiments using the spindle cell sarcoma of chickens also gave negative results as far as the emanation was concerned.

P. W. B-S.

LHERMITTE (J.). **Les lésions cérébrales de la polynévrite avitaminique (Béribéri expérimental).**—*Rev. Neurologique.* 1916. July. Vol. 23. No. 7. pp. 6–8.

The author states that very little has been done in the study of the changes in the central nervous system in deficiency diseases. He therefore in 1914 commenced work with the object of demonstrating the presence of changes if any; the investigation has been interrupted, but what was done is of interest. Severe polyneuritis was induced in a fowl by rice feeding and when paralysis was well marked the bird was killed and the nervous system carefully examined. The sciatic nerves as usual showed marked evidence of degeneration of their constituent fibres without evidence of vascular inflammatory changes. There were degenerative changes in the cells of the anterior horn of the cord not affecting the nuclei and nucleoli. The grey matter of the brain showed very marked lesions of the cells and neuroglia, similar to those that are found in classical psychopolyneuritis characterised by alterations of the colour and form of the nerve cells, their progressive disintegration being associated with a reactionary proliferation of the neuroglia.

These cortical lesions are associated with "alimentary avitaminic polyneuritis," experimental beriberi, and toxic polyneuritis.

P. W. B-S.

CHOLERA.

SANARELLI (G.). i. **Pathogénie du cholera. Reproduction expérimentale de la maladie.**—*C. R. Acad. Sci.* 1916. Nov. 6. Vol. 165. No. 19. pp. 538–540. ii. **La patogenesi del colera.**—*Ann. d'Igiene.* 1916. Nov. 30. Vol. 26. No. 11. pp. 685–691.

A series of observations on the production of cholera in the rabbit. It is owing to a lack of immunity that a recently born rabbit succumbs to cholera whether inoculated subcutaneously or intravenously or fed in large doses. In the author's opinion the vibrios when given per os do not reach the small intestine through the stomach, in which *V. cholerae* can never be found, but after absorbtion by the mucous membrane of the mouth and the tonsils by means of the blood or lymph channels. The vibrios first appear in the neighbourhood of the ileocaecal valve—in the ileum, caecum and appendix. In some cases they spread along the small intestine, even occasionally reaching the duodenum but this usually remains sterile like the stomach. Recently born rabbits, if of mothers inoculated against cholera, cannot be infected with cholera any more than adult ones can. They have acquired a premature immunity.

Immunity the result of age can, however, be broken down and a typical cholera attack can be made possible, if the rabbit is given an inoculation of living Coli into the walls of the appendix or the sacculus rotundus a few hours before inoculation or feeding with *V. cholerae*, or even if 1–2 cc. of a filtered 48 hours broth culture of *B. coli* is given intravenously. The Coli toxins act on the intestinal walls and predispose them to the cholera attack that ensues. Rabbits previously inoculated against either *V. cholerae* or *B. coli* do not respond to this method of producing typical cholera.

The author obtained similar results with two vibrios, one recently isolated on the Isonzo front and one isolated as long ago as 1911 ; the latter was the more toxic and while more profound symptoms accompanied death, far fewer vibrios were to be found in the intestinal canal. This recalls cases occurring in human beings, where with severe symptoms vibrios are found in the faeces with difficulty if at all.

H. Schütze.

NICHOLS (Henry J.). **Experimental Observations on the Pathogenesis of Gall-Bladder Infections in Typhoid, Cholera, and Dysentery.**—*Jl. Experim. Med.* 1916. Nov. 1. Vol. 24. No. 5. pp. 497–514.

The author suggests that gall bladder infections following on cholera attacks " are due to a portal or general septicaemia with elimination of organisms in the bile " (a process of this kind having been demonstrated by him experimentally in the case of typhoid) and thinks that the apparently smaller number of chronic carriers in cholera may be due in part to the small percentage of cases in which invasion of the blood occurs.

That gall bladder lesions are not to be found in rabbits after intravenous inoculation [here the author ignores the results of GREIG, this *Bulletin*, Vol. 8, p. 167] the author considers to be due to the fact that most samples of rabbit bile are antiseptic to *V. cholerae*.

H. S.

NERI (Filippo). **Ricerche sperimentali sulla vaccinazione antitifica e anticolerica.** [Experimental Research on Typhoid and Cholera Vaccines].—*Sperimentale.* 1916. Nov. 14. Vol. 70. No. 5. pp. 469–518.

A comparison of the agglutinin and bacteriolysin producing properties of a number of cholera vaccines and of the two methods of inoculation—subcutaneous and intravenous.

The following cholera vaccines were chosen:—The vibrios are suspended in (*a*) $\frac{n}{10}$ caustic soda, (*b*) 2 per cent. formalin, (*c*) physiological saline, 0·5 per cent. phenol being added with or without previous heating of the vaccine to 53° for one hour, (*d*) $\frac{n}{10}$ sodium carbonate + 0·5 per cent. phenol (in this the vibrios are quickly sterilised—five hours for a 1,000 million per cc. emulsion—and dissolve to give a faintly opalescent solution). The $\frac{n}{10}$ caustic soda vaccine was found to become inactive and incapable of producing antibodies in a few days. The sodium carbonate vaccine (*d*) appeared somewhat superior to both the heated and the formalised.

No appreciable difference was to be seen in the antigenic power of the two unheated phenolised vaccines, the one being a suspension in physiological saline and the other in $\frac{n}{10}$ sodium carbonate and it is difficult to see why the author suggests the use of the latter; the only superiority he implies is that sterility is somewhat more quickly attained, the difference however being a matter of hours.

As regards the two methods of inoculating, the author confirms the findings of previous workers—there is nothing to choose between them for the production of bacteriolysin, but for agglutinin the intravenous method gives consistently better results.

[Although the experiments recorded tend to point as indicated above, the differences observed are so undecisive considering the numbers of animals employed (between two and four for each type of vaccine) that definite conclusions cannot with justification be drawn.]

H. S.

LEVI DELLA VIDA (Mario). **Presenza di agglutinine non specifiche in alcuni sieri agglutinanti il vibrione del colera.** [Non-Specific Agglutinins in Cholera Sera.]—*Ann. d'Igiene.* 1916. Dec. 31. Vol. 26. No. 12. pp. 746–756.

The opinion is expressed that many workers are too inclined to believe that inagglutinable vibrios are modified Koch strains and it is pointed out as a significant fact, that while it is not rare to isolate inagglutinable vibrios from water, it is exceptional to do so from faeces.

Three partially inagglutinable strains isolated from non-cholera cases are described in this paper. The author considered their agglutinability might be due to the previous cholera inoculation of the men, in the same way as inagglutinable typhoid strains are obtained by growing *B. typhosus* in typhoid agglutinating serum. The three strains were morphologically and culturally similar to the Koch vibrio, but serologically there were differences. Pfeiffer was negative with all three and the agglutinations that resulted with four different sera are shown in the table opposite.

The author decided that this meant :—

(1) That the strains were true cholera vibrios which had lost their agglutinability partially for some sera, wholly for others, or

(2) That they were not true cholera vibrios and the agglutination was a group phenomenon, or

(3) That the agglutination was non-specific and due to normal agglutinins in some of the sera.

It was found that agglutinability was not restored by a preliminary heating of the vibrio emulsions to 100° C. for an hour as suggested by Dreyer and Jex-Blake and by Porges.

Absorbtion experiments with cholera serum went to prove that the agglutinins for the Cremona and R 82 strains in the $\frac{1}{10000}$ serum were group agglutinins, while the agglutinins from R 154 in the $\frac{1}{8000}$ serum were more distinct and could not be removed by absorbing that serum with *V. cholerae.*

Autogenous sera prepared from the several inagglutinable strains were seen to be incapable of agglutinating *V. cholerae* or indeed either of the two other and heterologous inagglutinable vibrios.

The author considered that the Pfeiffer test and these serological results went to prove that the three vibrios were not true cholera organisms.

A number of normal sera were tested for the presence of agglutinins and it was found that horse, mule and ass sera sometimes contained agglutinins up to a titre of $\frac{1}{150}$ and $\frac{1}{250}$ for *V. cholerae* as well as the three inagglutinable vibrios, but that human, rabbit and goat sera were always free of them.

H. S.

Puntoni (Vittorio). **Ancora sui vibrioni "inagglutinabili."** [Inagglutinable Vibrios.]—*Ann. d'Igiene.* 1916. Dec. 31. Vol. 26, No. 12. pp. 741–746.

Two vibrio strains were isolated from an Italian soldier who contracted what was apparently typical cholera. While both strains were culturally *V. cholerae,* only one agglutinated with cholera serum, the other being quite inagglutinable.

After some months the agglutinable strain was found to have lost its agglutinability. Serological tests were now carried out with the two strains and sera prepared from them. These did not agglutinate the Koch vibrio. In the same way absorbtion of agglutinin and complement fixation tests were negative when true cholera sera were used with the inagglutinable strains and, vice versa, when typical cholera organisms were tested against the sera prepared from the inagglutinable vibrios.

No bacteriolysis took place when the inagglutinable strains were injected intraperitoneally into guinea-pigs previously immunised with the true *V. cholerae.*

The author concludes that the Koch vibrio has here undergone a biological change, which in the case of the strain isolated in an

LEVI DELLA VIDA (Mario).]

Serum Reactions of Three Partially Inagglutinable Strains of Vibrio.

Vibrios.	Serum : Titre = $\frac{1}{10,000}$					Serum : Titre = $\frac{1}{8,000}$					Serum : Titre = $\frac{1}{3,000}$			Serum : Titre = $\frac{1}{4,000}$		
	$\frac{1}{100}$	$\frac{1}{200}$	$\frac{1}{500}$	$\frac{1}{1,000}$	$\frac{1}{2,000}$	$\frac{1}{100}$	$\frac{1}{200}$	$\frac{1}{500}$	$\frac{1}{1,000}$	$\frac{1}{2,000}$	$\frac{1}{100}$	$\frac{1}{200}$	$\frac{1}{500}$	$\frac{1}{100}$	$\frac{1}{200}$	$\frac{1}{500}$
Cremona	+++	+++	+++	±	—	++	—	—	—	—	—	—	—	—	—	—
R 82 ..	+++	+++	±	—	—	—	—	—	—	—	—	—	—	—	—	—
R 154 ..	—	—	—	—	—	+++	+++	+++	±	—	—	—	—	—	—	—

inagglutinable condition took place in the man's intestinal canal, in the case of the other strain it occurred *in vitro.* [The possibility of a confusion of culture tubes having taken place and of the agglutinable strain having been lost is not considered by the writer.]

H. S.

KUTSCHER (FR.) & SCHAEFER. **Die Verwendung von Typhus- und Choleraimpfstoffen als Antigene bei der Komplementbindungsreaktion.** [The Use of Typhoid and Cholera Vaccines as Antigens for Complement Fixation.] —*München. Med. Woch.* 1916. Oct. 31. Vol. 63. No. 44. pp. 1570–1571.

Three different cholera vaccines were tested as antigens for complement fixations, using a donkey agglutinating serum and a rabbit bactericidal serum as antibodies, and were found to fix well and to equal extent and to be durable in this respect. The authors find that for the complement fixation tests sheep cells can be kept as long as 14 days by storing in a cool place after adding 0·1 per cent. phenol to the saline suspension. Experiments with such corpuscles in the Wassermann test were not made, he mentions.

H. S.

HALL (H. C.). **Ist es möglich, einen sofort brauchbaren Dieudonnéagar herzustellen, ohne die Zusammensetzung des Substrates zu verändern?** [A Ready-to-Use Dieudonné Medium.]—*Berlin. Klin. Woch.* 1916. Feb. 28. Vol. 53. No. 9. pp. 217–219.

Judging the absorbtion of CO_2 from the air to be the main feature in the "maturing" that Dieudonné agar requires and in order to ascertain the time taken to "mature" by the Dieudonné blood-alkali mixture when stored in bottles, the author carried out the following experiment. The defibrinated blood-alkali mixture was filled into bottles some of which had cotton wool plugs, others air-tight rubber caps, and kept at 5° C.

After standing for three weeks plates were poured with agar in the usual way, stood with the lids off and under sheets of sterile paper at 37° C. for various lengths of time and then inoculated with cholera.

Hours the plates stood at 37°.	1	.2	3	4	5	24
Mixture stored with cotton wool plugs.	No growth.	Growth.	Very plentiful growth.	Very plentiful growth.	Very plentiful growth.	Very plentiful growth.
Mixture stored with air-tight rubber caps.	No growth.	No growth.	No growth.	No growth.	One colony.	Plentiful growth.

When the period of maturation was prolonged to five weeks, the plates were ready within half to one hour after pouring, a very considerable improvement on the 48 hours needed when the mixture is fresh. Tested with a variety of organisms and artificially prepared cholera stools, the medium had strong selective powers. The author has tested blood alkali mixtures up to nine months of age, and found no depreciation in its qualities within that period.

H. S.

LANGE (Carl). **Ein neuer Nährboden für die Choleradiagnose.** [New Cholera Medium.]—*Zeitschr. f. Hyg. u. Infektionskr.* 1916. Vol. 81. pp. 138–153.

This diagnostic cholera medium has already, in 1915, been described by the author [this *Bulletin,* Vol. 6, p. 499]. The only additions to what has been already published are some " tips " as to the making of the medium and a recognition of criticism subsequently passed [this *Bulletin,* Vol. 7, p. 240]. To avoid the starch of the plates being attacked by the diastatic ferments which are present in stools, particularly diarrhoeal stools, it is necessary to dilute the faeces and not plate too thickly. The author admits that for this reason direct plating does not always give such good results with his medium as with some other media, for instance, Dieudonné, but declares that if a preliminary peptone water enrichment precedes the plating this alkaline starch medium is superior in that it gives a rapid growth, easily discernible colonies and very agglutinable material.

The paper also indicates the possibility of the use of casein and of milk as indicators (the proteolytic ferment produced by the cholera vibrio forming in these cases also a clear zone round the colonies) and of a combination of casein and starch, in which case only organisms producing both diastatic and proteolytic ferments would occasion complete transparency in the medium around these colonies. *B. subtilis* would seem to be the only organism to do this besides the vibrios.

H. S.

FUERST (Th.). **Lentzsches Blutalkalitrockenpulver zur Bereitung von Choleranährböden in Feldlaboratorien.** [Lentz's Desiccated Blood-Alkali Medium for Choleradiagnosis.]—*Deut. Med. Woch.* 1916. Feb. 24. Vol. 42. No. 8. pp. 226–227.

It was found that many samples of this particular dried Dieudonné medium [this *Bulletin,* Vol. 6, p. 43] had lost their selective properties and allowed of the growth of other organisms besides *V. cholerae.* It seemed as if, possibly owing to drying at too high a temperature, too much alkali had been absorbed. The author remedied this by dissolving the powder in ·2 per cent. soda solution. He found also that the addition of 2 per cent. cane sugar to Dieudonné (fresh or dried) was to be recommended as a means of furthering the rapid growth of *V. cholerae.*

H. S.

VERZÁR (Fritz) & WESZECZKY (Oskar). **Zur Stuhluntersuchung auf Typhus- und Cholerabazillen.** [Stool Examination for Typhoid and Cholera Bacilli.]—*Deut. Med. Woch.* 1916. Apr. 20. Vol. 42. No. 16. pp. 476–477. With 2 figs.

A plea for the importance of plating out all peptone water enrichment cultures regardless of whether vibrios are seen in the hanging drop preparation or not. Four hundred peptone water cultures were plated on to alkaline agar after examination in hanging drop and the results compared.

Of 17 cases which contained many vibrios after 18–24 hours at 37° C. seven had shown none at the end of the sixth hour, although plates spread at that time gave positive results. Five peptone waters from whose agar plates *V. cholerae* were isolated, showed no vibrios even after 18–24 hours at 37° C.

H. S.

BEAUVERIE (J.). **Recherches sur l'influence de la pression osmotique sur les bactéries. Cas du vibrion cholérique.**—*C. R. Acad. Sci.* 1916. Oct. 30. Vol. 165. No. 18. pp. 494–497.

By carrying out the cultivation of *V. cholerae* in ordinary broth and broth containing 7, 9, 15, 20, 30, 50, 90 and 100 per mille Na Cl [except in one instance " per cent." is always and obviously erroneously printed] it was seen that while growth was visible in ordinary broth after four hours and after 24 hours in all concentrations up to but not over 50 per mille, the thickest pellicle formation was observed in the 30 per mille tubes.

Cultures in 30 to 50 per mille concentrations, however, age quickly, showing involution forms and loss of motility within a few days.

The author after pointing out that limitation of nutriment and accumulation of toxins are the factors determining involution, suggests that osmotic pressure may influence toxin formation and in this way explain the rapid degeneration of the vibrios growing in media of raised Na Cl content which, to begin with, favoured development.

The marked pellicle formation occasioned by a 30 per mille concentration of Na Cl suggests to the author an advantage in raising the salt content of peptone water from 5 per mille to that figure in order to facilitate the diagnosis of cholera.

H. S.

JASTROWITZ (H.). **Cholera und Paratyphus B.**—*Deut. Med. Woch.* 1916. Aug. 10. Vol. 42. No. 32. pp. 973–974. With 1 chart.

A case of simultaneously acquired cholera and paratyphoid B is described and the necessity pointed out of not allowing a light cholera attack, such as often occurs in the inoculated, to be overlooked because one cause of gastro-enteritic symptoms, namely paratyphoid B bacilli, has already been discovered.

H. S.

ARNETH. **Zur Behandlung der Cholera.** [Cholera Therapy.]—*Deut. Med. Woch.* 1916. Aug. 3. Vol. 42. No. 31. pp. 935–938.

The author believes strongly in the efficacy of Bolus alba, to be given in the early stages and in large quantities ; he also advises its use as a prophylactic, served out to soldiers for putting in the tea of their water bottles, when they advance into infected country.

The usual measures—saline infusions, warmth, stimulants such as caffein, strophanthus, etc., are mentioned also.

H. S.

Fejes (Ludwig). **Die praktische Bedeutung der Typhus und Choleraschutzimpfung.** [The Practical Importance of Typhoid and Cholera Prophylactic Inoculation.]—*Deut. Med. Woch.* 1916. Apr. 6. Vol. 42. No. 14. pp. 412–413.

After calling attention to the great change in the clinical features that is observable in typhoid patients who have been prophylactically inoculated against typhoid, the author goes on to point out that in the case of those protected by inoculation against cholera, a subsequently contracted attack of cholera is not so very much altered in character. Diarrhoea and vomiting are present and bring about a tremendous loss of body fluid with all its pronounced consequences. Only the more specific toxic effects such as those on the nervous system are wanting. This the author explains as follows:—

The morbid processes in cholera are restricted almost entirely to the intestinal tract. It is here in the intestinal epithelium that the cholera toxins are liberated, but in this circumscribed area the immune powers of the inoculated are not of much avail. Consequently the loss of fluid by the body and the symptoms that result are much the same in both inoculated and uninoculated. Only when we come to the influence of the toxin on more distant parts of the body such as the nervous system, are we able to see the beneficial effect afforded by prophylactic inoculation, the toxins being prevented from reaching those parts.

H. S.

Reprints and Pamphlets received:—

Brock (B. G.). Syphilis and the Commonwealth.—*S. African Med. Rec.*, 1917.

Brug (S. L.). Pigment und andere Einschlüsse in Dysenterieamöben. —*Arch. f. Schiffs-u. Trop.-Hyg.*, 1916. Vol. 20.

Ghosh (Hari Nath). The Treatment of Liver-Abscess by intra-Hepatic Injections of Emetine following Aspiration.—*Calcutta Med. Jl.*, 1917. Jan.

King (W. V.). The Effect of Cold upon Malaria Parasites in the Mosquito Host.—*Jl. Experim. Med.*, 1917.

Low (George C.) & **Newham** (H. B.). Intravenous Injections of Antimony in the Treatment of Malaria.—*Brit. Med. Jl.*, 1917.

Mauritius. Dept. of Agric Bull. No. 4. Scientific Ser.—Investigations on the Camphors of Mauritius.

Morse (Plinn F.). The General Pathology of Pellagra, with Special Reference to Findings in the Thyroid and Adrenals.—*Jl. Lab. & Clin. Med.* Vol. 1. No. 4.

Morse (Plinn F.) & **Stott** (Ethel). Studies of the Tissue Reactions to Various Products of the Tubercle Bacillus.—*Jl. Lab. & Clin. Med.*, 1916.

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Note.—On direct application (not through agents or booksellers) any of the foregoing reprints or pamphlets will be sent on loan to any part of the world, the Bureau paying outward postage.

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Books received.

Jackson (Thomas Wright) [M.D.]. Plague. Its Cause and the Manner of its Extension—Its Menace—Its Control and Suppression—Its Diagnosis and Treatment. With Bacteriologic Observations by Dr. Otto **Schobl.**—192 pp. Illustrated. Press of J. B. Lippincott Co.

Panama Canal. Annual Report of the Governor for the Fiscal Year ended June 30, 1916.

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TROPICAL DISEASES BULLETIN.

Vol. 9.] 1917. [No. 7.

SLEEPING SICKNESS.

HECKENROTH (F.). **La Trypanosomiase humaine au Sénégal.**—*Bull. Soc. Path. Exot.* 1916. Nov. Vol. 9. No. 9. pp. 723–731.

In Senegal during 1915 and the first seven months of 1916, 184 fresh cases of sleeping sickness have been put on treatment; of these 99 were men, 39 women and 46 children. In a table indicating the locality in which infection was contracted it is shown that 161 cases originated in the Petite Côte.

After the work of the Sleeping Sickness Commission to Senegal of 1908* the administration saw the necessity of a campaign against human trypanosomiasis. This appeared easy as the area infected was well defined and of relatively little extent. The village of Sors, near St. Louis, became the centre at which all cases of trypanosomiasis were to be treated. From June 1908 to December 1909 there were 58 entries but during the following years the numbers fell successively to 44, 37 and 22, until at the beginning of 1913 there were at Sors no more than eight patients. Cases of sleeping sickness amongst the native population continued to be numerous, but these escaped the vigilance of the administration, thanks to the complicity of the chiefs who considered internment of the sick at Sors to be a vexatious measure.

It was then that the present Commission was established by the Governor General with a view to examining the state of sleeping sickness in the Colony. As mentioned above in 19 months (1915–1916) 184 cases were found whereas in 1908–9 only 58 cases were admitted to Sors. Heckenroth then makes certain recommendations regarding the general method of dealing with the disease.

From observation of the cases encountered three points only called for special attention.

1. The slowness with which the disease develops in Senegal. Patients seen after one, two and even three years of sickness do not appear more ill than the natives of French Equatorial Africa after six months or one year. Sleeping sickness patients in Senegal who remained either untreated or insufficiently treated did not seem distinctly worse when seen again some weeks later, while in the Congo it was constantly observed that the condition of such cases was aggravated.

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* See *Sleeping Sickness Bulletin*, Vol. 3, pp. 201-6.

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2. The blood of 138 patients who contracted the infection in the Petite Côte (Senegal) was examined for trypanosomes; parasites were found 11 times by direct examination of a drop of blood and 95 times after centrifugation of 10 cc. of blood in those cases in which direct examination was negative. On 21 occasions the centrifugation method was negative and in 11 cases it was not performed. Thus in only 7·9 per cent. of cases were trypanosomes found in the peripheral blood by direct examination. This figure is far behind that obtained by the author in the Congo (32 per cent.), and by MARTIN, LEBOEUF and ROUBAUD in Equatorial Africa (37 per cent.). THIROUX, WURTZ and TEPPAZ however failed to find the parasites in the peripheral blood by direct examination in 40 Senegal cases. In the 11 cases in which trypanosomes were found by direct examination of the blood they were scanty in six and present in fair numbers in the remainder.

3. LAFONT and DUPONT noted the presence of albumen in the urine of 80 per cent. of trypanosomiasis cases in Senegal. Heckenroth had never seen this in sleeping sickness cases in the Congo, but amongst 117 cases in which the urine was examined in the Petite Côte albuminuria was noted 33 times. The author considers however that this is not a symptom of trypanosomiasis but of some intercurrent disease, notably bilharziasis. Eggs were found in 20 of these cases and in almost all there was on centrifugation of the urine a deposit of red cells.

The slower evolution of sleeping sickness in Senegal than in the Congo and the rareness of the parasites in the peripheral blood seem to indicate that the virus of Senegal, which appears specifically identical with that of the Congo, has undergone an attenuation of virulence, the explanation of which must perhaps be sought in the different conditions of life of the tsetse-fly of the Congo—a wet country—and of those of Senegal—a dry country.

W. Yorke.

MAYNARD (G. D.). **The Trypanosomes of Sleeping Sickness; being a Study of the Grounds for the Alleged Identity of *T. brucei* with those causing Disease in Man in Nyasaland.**—*S. African Inst. Med. Res.* (No. VI). 1915. Dec. 17. 39 pp. With 26 charts. Johannesburg: Published by the Institute. [Price 5*s*.]

This paper is concerned mainly with a critical analysis of the various biometric curves of *T. brucei* and human strains of trypanosomes which have been constructed by the Royal Society's Commission to Nyasaland and others.

Amongst the author's conclusions are the following:—

Analysis of length distributions shows that the dimorphic trypanosomes *T. rhodesiense*, *T. brucei*, *T. gambiense*, trypanosomes of Nyasaland sleeping sickness and Nyasaland wild game strain have certain features in common. With some exceptions, which are not confined to any particular strain, the general character of resolution is similar. There appears to be less similarity between the Nyasaland human strain and *T. brucei* than between *T. rhodesiense* (Stephens and Fantham) and *T. gambiense* as recorded by these authors.

Analysis suggests that uniformity in treatment of strains, prior to inoculation of rats, from which measurements are made, may be an important factor in determining the mean size and the variability of the components of the distributions. At the present no valid argument in regard to the identity or otherwise of *T. brucei* and the trypanosome causing disease in man in Nyasaland can be drawn from length-measurement and distributions. This method of investigation may probably prove of service in the study of trypanosome species when proper analytical methods are employed at the time the investigations are being undertaken, but nothing of value can be expected from an uncritical examination, or mere inspection, of the crude distributions.

At present the only valid argument in favour of the identity of the trypanosome causing disease in man in Nyasaland with *T. brucei* is to be drawn from experiments in regard to their pathogenicity for animals. There is some doubt, however, as to what weight should be attached to differences in period of illness before death, and moreover, whether any stress should be laid on similarity in this respect in the absence of confirmation by other methods of investigation.

Immunilogical experiments carried out by the Royal Society's Commission and others negative the suggestion of identity of *T. brucei*, Nyasaland human strain, Nyasaland wild *G. morsitans* strain and *T. rhodesiense*, and such serological experiments as have been undertaken negative the supposition that *T. brucei* is identical, or even closely allied, to the trypanosome causing sleeping sickness in man.

There is no evidence at present from the known geographical distribution of *T. brucei* to suggest that it is a cause of sleeping sickness in man; and even if it were found to produce disease in man this would of itself constitute no greater argument in favour of its identity with the Nyasaland strain than with *T. gambiense*.

It would appear therefore that there is very little scientific evidence to support the contention that *T. brucei* and the trypanosome causing sleeping sickness in Nyasaland are the same species, while there are some very valid reasons for regarding them as distinct.

[The author does not produce any new facts in aid of this contention. A great deal of the paper is open to criticism. The arguments in support of the identity of the trypanosome infecting man in South Central Africa and that of the same appearance found in game and wild *Glossina morsitans* have been developed by the reviewer and others in a number of papers and need not be repeated.

In a subject of such practical importance as the one under discussion one feels that the onus of proof lies with those who deny the identity of two parasites which have not yet been shown to be different, but which on the contrary exhibit more than a superficial resemblance to one another morphologically, as regards pathogenicity and also as to the manner of their development in *Glossina morsitans.*]

W. Y.

MACFIE (J. W. S.). **Preliminary Note on a Monomorphic Trypanosome found in the Blood of a Native of the Gold Coast.**—*Brit. Med. Jl.* 1917. Jan. 6. pp. 12–13. With 1 chart.

The patient who was infected with the trypanosome described in this paper was a native and a member of the Gold Coast Constabulary. He was examined by GRAHAM at Tamale and found to be suffering from trypanosomiasis. The history suggests that infection might have occurred three weeks previously. Apart from slight fever, which

Graham thought might not have been due to the trypanosomes, there were no symptoms. After a single injection of atoxyl the trypanosomes disappeared from the blood and to the time of writing had not been seen again.

Blood films were sent to Macfie, the first in September last, and a second made before the trypanosomes disappeared from the blood was sent later. Both films contained fairly numerous trypanosomes.

Even at first glance it was evident that the morphology of the parasite was unusual; it was monomorphic and very closely resembled *T. vivax.* The body showed the characteristic abrupt narrowing immediately anterior to the nucleus; the cytoplasm was relatively clear and showed an alveolar structure; the posterior end was usually blunt, and the large rounded blepharoplast was terminal or nearly so; the undulating membrane was narrow and there was always a long free flagellum; the nucleus was oval and often divided into several pieces.

A hundred trypanosomes were measured from each film and a biometric graph constructed. The maximum length was 24μ, the minimum 18μ, and the average 20·7μ. The graph clearly indicates the monomorphic character of the parasite.

The author points out that although the morphology of the parasite very closely resembles that of *T. vivax* the result of the small number of measurements made suggests that it is a little smaller, the crest of the curve occurring at 21μ instead of at 23μ. The trypanosome appears to be intermediate between *T. uniforme* and *T. vivax* as regards its morphology but further examinations must be made before any definite conclusion can be reached.

T. vivax was found in no less than 76 per cent. of the hump-backed cattle at Accra and it would therefore be a serious matter if this species were proved to be a pathogenic to man. As the patient has been apparently free from parasites for a long time the chances of obtaining the strain for laboratory experiments are not very great.

[Dr. Macfie has shown one of the blood films in question to the reviewer who was much impressed by the morphological similarity of the parasite to *T. vivax.* Reference might be made to the fact that **Blacklock** and **Yorke** succeeded in infecting rabbits with *T. vivax* and that in a number of these animals the infection ran a rapid and fatal course. No change in the morphology of the trypanosome was observed after passage through six rabbits [see this *Bulletin,* Vol. 3, p. 168].

W. Y.

Macfie (J. W. Scott). **Two Strains of Human Trypanosome from the Gold Coast and Northern Nigeria.**—*Report of the Accra Laboratory.* 1915. pp. 55–57. With 2 text figs. London: J. & A. Churchill.

The first of these strains came from a case of sleeping sickness in Ashanti; it was sent to the Laboratory in two monkeys (Cercopithecus) by Dr. **Ingram.** One of these monkeys died on the 93rd day and the other, from amoebic dysentery, on the 64th day. Five guinea-pigs and one white rat were inoculated but only two guinea-pigs became infected, one of which died on the 78th day, the other being alive and well at the time of writing. The parasite therefore does not appear to be very pathogenic. Morphologically the trypanosome was not distinguishable from *T. gambiense.*

The other strain examined was that causing sleeping sickness in the Benue River in Northern Nigeria. Blood films and smears of gland juice were sent to the author by Dr. FOY from seventeen suspected cases of sleeping sickness (2 Europeans and 15 natives). Trypanosomes were found in 14 of these (2 Europeans and 12 natives). In all cases the parasites were scanty; they were of the polymorphic type and did not exhibit the forms characteristic of *T. rhodesiense* or *T. nigeriense.*

W. Y.

INGRAM (A.). **Concerning Age, Sex and Race in the Incidence of Human Trypanosomiasis.**—*Report of the Accra Laboratory.* 1915. pp. 36–44. London: J. & A. Churchill.

In this paper the author summarises the literature dealing with sex and age of individuals suffering from trypanosomiasis; he quotes at length from TODD's paper on the subject [see this *Bulletin*, Vol. 2, p. 255].

The following table, in which the figures obtained by TODD in the Congo (1903–05) and the Gambia (1911) are compared with those of MACFIE and GALLAGHER in the Eket district of Nigeria (1912–13) and KINGHORN and WADE in Ashanti (1909–13), is of interest.

Analysis of Cases of Trypanosomiasis seen in Ashanti in Comparison with figures for the Congo, Gambia and Eket District of Nigeria.

	Males.			Females.			
Age.	0–13. %	14–44. %	45 and over. %	0–11. %	12–39. %	40 and over. %	No. of cases.
Congo, 1903–05 combined cases	6·4	60·2	1·35	2·3	29·75	0·0	348
Gambia, 1911 .	16·4	39·3	0·0	7·6	36·7	0·0	79
Eket District, 1912–13 ..	38·7	23·9	0·4	17·6	19·4	0·0	222
Ashanti, 1909-13	13·1	48·3	1·6	2·3	30·1	4·6	259

Other papers bearing on the subject are discussed in some detail. The conclusion is:—

"Age, sex and race incidence in human trypanosomiasis vary directly with the extent to which the individual is exposed to the bite of infective tsetse flies."

W. Y.

BOUET (G.). **Contribution à l'étude des zones à glossines du Sénégal. (Region du chemin de fer de Thiès à Kayes).**—*Bull. Soc. Path. Exot.* 1916. Dec. Vol. 9. No. 10. pp. 802–813. With 1 map.

The railway connecting Senegal with the Soudan from Thiès to Kayes has a length of about 700 km. and about 135 km. of this is through a belt of *Glossina morsitans.* The fly exists in islands which are as a rule some distance from large centres; these areas are frequented by large game, at least during certain periods of the year.

The Glossina of this region, as those of the Upper Gambia, ar convey only *T. dimorphon*; they are free from *T. pecaudi* and *T. cazalboui*. It is to be feared that the passage of numerous herds (of zebu in particular) coming from the Soudanese country may introduce into the Thiès-Kayes district the two latter trypanosomes. Furthermore Soudanese herds free from infection may become contaminated with *T. dimorphon* whilst traversing this fly belt, but as most of the animals are destined to be slaughtered within a fortnight of their arrival at Lyndiane there would be a slight mortality only from this cause.

The completion of the railway will modify this state of affairs if care be taken to send the animals in fly proof trucks as is done on the railway in the Ivory Coast.

The population, which will migrate towards the line of the railway to cultivate ground nuts, will gradually cause the disappearance of the game and in consequence of *Glossina morsitans*.

The road from Cotiari to Ambidédi employed by the military and civil population of the Soudan during a portion of the year is to be relaid to permit of the use of motor traffic and this will be an improvement on preceding years. It is desirable that mechanical traction should be generally employed in all regions in French West Africa where trypanosomiasis and Glossina are found.

W. Y.

BOUET (G.) & ROUBAUD (E.). **Répartition des glossines à la Côte d'Ivoire.**—*Bull. Soc. Path. Exot.* 1917. Jan. Vol. 10. No. 1. pp. 37–39.

In 1907 Bouet published an account of the distribution of Glossina in the Ivory Coast. He observed that *G. palpalis* exists all over the Basse Côte, that *G. fusca* has nearly the same distribution but is rarer and more localised; that *G. pallicera* is found along the railway from Azaguié to Tiassalé; and that *G. morsitans* occurs at Toumodi. In the Haute Côte *G. palpalis*, *G. fusca*, *G. morsitans* and *G. tachinoides* are found. It was afterwards shown that true *G. morsitans* does not exist in the colony but a neighbouring species, *G. longipalpis*.

More recently the authors have made further observations regarding the distribution of the species of the Fusca group. True *G. fusca* was encountered in numerous localities of the Basse Côte whilst *G. nigrofusca* and *G. medicorum* were found at Azaguié on the railway.

A table is given showing the distribution of the various species of *Glossina* captured at the different stations on the railway. At Azaguié most species were found—*G. palpalis*, *G. pallicera*, *G. medicorum*, *G. fusca*, *G. nigrofusca*. From Tiemelekio (K. 162) on to Bouaké *G. longipalpis* predominated.

With regard to the zones of distribution of the various species the authors find that from the Coast to about 6° N. *G. palpalis* and the species of the Fusca group predominated; between 5° 30′ and 5° 50′ is the exclusive zone of *G. pallicera*. This appears to be equally, but in a less absolute degree, the zone of distribution of *G. medicorum* and *G. nigrofusca*. Towards 6° 20′ commences the zone of *G. longipalpis* which predominates all over the hinterland as far as 10° N. This zone together with analogous zones in the Gold Coast and Togoland forms a large belt of *G. longipalpis* midway between the coast (region of large forests) and the Soudan. Towards 8° *G. tachinoides* appears, the zone of predominance of this fly extending over all the country behind the Ivory Coast.

From South to North there are then in the Ivory Coast four principal zones of Glossina characterized by the predominance of different species. These are—(1) the zone of *palpalis* and *fusca*, (2) the zone of *pallicera*, (3) the zone of *longipalpis*, and (4) the zone of *tachinoides*.

W. Y.

ROBERTSON (M.). **Report upon the Present Conditions of the Siroko Valley, Mount Elgon.** Dated 21st January, 1914. [M.S. Colonial Office Report].

These observations regarding the distribution of *G. palpalis* in the Siroko Valley were made between 17th November and 31st December, 1913.

The geography of the valley with the distribution of tsetse is shown in a map which accompanies the report. There are three narrow strips of fly-infested forest along parts of the three rivers which go to form the Siroko, and fly is also found in two swampy forest areas in communication with the Siroko river. The fly area in the Siroko valley as a whole is isolated from other fly areas.

The infectivity of *G. palpalis* in the valley was determined by feeding experiments and by microscopic examination. A number of flies (1,004) were fed in groups upon two healthy dogs and one healthy goat' but the animals did not become infected. These flies were subsequently dissected and the gut and proboscis examined. Flagellates were found in the gut of 24 and in the proboscis and gut of one, but in the last case the proboscis forms were not attached and were few in number. From the morphological character of the parasites found the author concludes that they did not form part of the life-cycle of any of the pathogenic group of mammalian trypanosomes but were derived from crocodiles which are very numerous in all the rivers of the valley.

Nine inoculations into dogs were made from the blood of buck shot in the valley with negative results. No case of sleeping sickness has ever been reported from the Siroko valley. As a result of this work Miss Robertson writes, "We seem therefore justified in concluding that the mammalian group of trypanosomes has not yet arrived in the Siroko Valley fly-belt."

The Siroko valley is closed at the present time in so far as the cultivation of land and the building of permanent huts are concerned, but there is no attempt made to exclude people from the valley.

With regard to the question of re-populating the district Miss Robertson states that experience points to the conclusion that an area opened under proper regulations achieves a more satisfactory level of safety than a similar area insufficiently closed. The area to be cleared in the Siroko Valley is not excessive nor would clearing be difficult; the population is very large and there is a great demand on the part of the people to occupy the land.

The second portion of the report deals with the administrative aspect and general recommendations for the safe handling of the area in question. Details are given of a suggested scheme for the re-population of the valley.

W. Y.

JACK (Rupert W.). **Tsetse-Fly Investigations, Sebungwe, August-September 1916.**—*Report to Director of Agriculture, Salisbury, Rhodesia, British South Africa Company.* Dated 23rd September 1916. [MS. Report received in Colonial Office, November 27, 1916].

This report refers to a visit to certain of the tsetse-fly areas in the Sebungwe district during August-September 1916. Details of the itinerary are given.

The fly continues to spread rapidly in certain parts of the district, especially in the south-west corner of the belt. In other portions of the belt (Headwaters of the Mzola River) the fly although not actually spreading is increasing in number rapidly. The first record of fly in this area was in 1914 and now the pest is present in great numbers.

As a result of observation upon an outbreak of trypanosomiasis (*T. pecorum*) amongst cattle on Meare's Farm—Sikombella River—Jack concludes that the disease is spread by some agency other than tsetse. [In this connection the work of Van SACEGHEM might be consulted (see this *Bulletin*, Vol. 9, p. 33).]

The remainder of the report concerns itself with the question whether a certain small fly area—the Sipani Vlei—would be suitable for an experiment to ascertain the effect of the exclusion of game. Jack concludes that " apart from this drawback [its remoteness : the place is 3½ days from Gokwe] Sipani Vlei from its limited extent, intense infestation, and isolated position in the dry season, is admirably suited for an experiment, which would, if effectively carried out, supply very valuable information on the relation of big game to tsetse-fly."

W. Y.

BAUGNIET. **La Trypanosomiase animale à la Station expérimentale d'Elevage de Miao (Kasai).**—*Bull. Agric. du Congo Belge.* 1915. Sept.-Dec. Vol. 6. No. 3-4. pp. 222-249. With 6 plates.

Miao (Kasai) has not escaped trypanosomiasis any more than other breeding stations in the Congo. Tsetse is relatively scanty in this district and so far as the author is aware only *G. palpalis* is present. Tabanids are common and a dozen species were found; they occur at two seasons of the year--May, the end of the rainy season and September, the beginning of the rainy season. *Stomoxys calcitrans* is found in considerable numbers in the rainy season. The author believes however that it is unnecessary to incriminate any other agent than Glossina as concerned in the transmission of *T. dimorphon-congolense* and *T. cazalboui.*

Regarding the various trypanosomes found, *T. dimorphon-congolense* occurred 67 times—in 65 cattle and 2 horses. The nomenclature *dimorphon-congolense* is used as it is difficult to distinguish by simple examination between *T. dimorphon* (Laveran) and *T. congolense* (Broden). The parasite in question differed from *T. dimorphon* (Laveran) in that it did not exhibit any long forms (20–22μ) typical of the latter, and again it did not correspond exactly to BRODEN's description of *T. congolense* as it possessed longer and narrower forms than *T. congolense* (Broden). *T. cazalboui* was met with 22 times in cattle and *T. ingens* three times, twice in cows and once in a heifer.

An account of the symptoms in infected cattle and horses is given; stress is laid on keratitis.

The main portion of the paper concerns itself with an account of various attempts at therapy. A number of methods were employed and so far as infections with *T. dimorphon-congolense* were concerned the best results were obtained with orpiment and atoxyl. Of eight animals infected with *T. dimorphon-congolense*, seven were cured by an injection of 1 gm. of atoxyl and 4 gm. per 100 kilos of body weight of orpiment. The eighth animal, which received 1 gm. of atoxyl and 6 gm. per 100 kilo of body weight of orpiment, died a month later. This large proportion of cures by arsenical preparations reported to have little effect on *T. dimorphon* and of which only the orpiment is active against *T. congolense* appears to the author to support the view that the parasite in question, *T. dimorphon-congolense*, is distinct from the other two.

For the treatment of cattle infected with *T. cazalboui* emetic-orpiment was most successful. Of five animals treated in 1914 three were cured; the other two were lost through errors of technique.

W. Y.

MITZMAIN (M. Bruin). **A Digest of the Insect Transmission of Disease in the Orient with Especial Reference to the Experimental Conveyance of *Trypanosoma evansi*.**—*New Orleans Med. & Surg. Jl.* 1916. Dec. Vol. 69. No. 6. pp. 416–424.

Most of the work dealt with in this paper has been published elsewhere and has already been summarised [see this *Bulletin*, Vol. 2, p. 130 and 133, and Vol. 3, p. 31].

The author reviews the evidence incriminating *Tabanus striatus* as the vector responsible for the transmission of surra. Under natural conditions this horse fly invariably interrupts itself while sucking blood and requires several distinct insertions of its proboscis before satiation is reached. Experimentally the insect has been observed to insert its proboscis 52 times when applied at short intervals to two hosts alternately. This suggests that a fly given the necessary materials for operating, namely, sick host and healthy host would transmit infallibly. Horse flies permitted to bite a highly infected horse and then successively applied to three healthy animals at intervals aggregating five minutes, infected the first of these but not the second and third. It was found that *Tabanus striatus* could transmit at various intervals from a few seconds up to 15 minutes after biting a sick animal, but not after longer intervals varying from 20 minutes to 26 days.

Tabanus striatus harboured *T. evansi* in an unchanged form for a period of 30 hours and the parasites were proved by inoculations to remain virulent for at least ten hours. There was no evidence of hereditary transmission. Preventive measures consisted in attacking the fly in the larval stage by chemically treating the sand along lake shores found harbouring them; protection of animals in darkened sheds, which was found to repel the flies; and avoiding bites in enzootic areas by keeping animals in the open only during the hours between 7 p.m. and 5 a.m.

Details of experiments and observations to ascertain the rôle played by *Musca domestica* and *Stomoxys calcitrans* as factors in the spread of surra are given; these have already been summarised [see this *Bulletin*, Vol. 2, p. 130].

The author is of opinion that every outbreak of surra in the Philippine archipelago which occurred during the three years he worked there could be accounted for satisfactorily by the direct method of transmission.

W. Y.

VAN SACEGHEM (R.) & NICOLAS (E.). **L'émétique dans le traitement des trypanosomiases.**—*Bull. Soc. Path. Exot.* 1916. Dec. Vol. 9. No. 10. pp. 813–823.

As tartar emetic clears the peripheral blood of trypanosomes with such remarkable speed—a dose of 6 mgm. per kilo injected subcutaneously sterilised the peripheral circulation of guinea-pigs infected with *T. ugandae* or *T. congolense* in eleven minutes—the question arises, whence come the trypanosomes which cause relapses. Two theories present themselves, firstly that there exist individuals resistant to emetic and secondly that there are in the organism parasites which escape the action of the drug.

Against the first view is the fact that forms resistant to emetic have not been observed by any worker, and moreover the blood of an infected animal treated with emetic does not produce infection in a healthy animal when injected. It is therefore necessary to conclude that the second hypothesis is the true explanation.

It has been shown that the serum of guinea-pigs which have received a lethal dose of emetic has not any trypanocidal action *in vitro*, even a few minutes after the administration of the emetic subcutaneously. Nevertheless in spite of the short sojourn of the drug as such in the blood it suffices to destroy all the trypanosomes swarming in the blood; but perhaps owing to rapid elimination or, it may be, to special modification which it experiences the drug exerts too little penetrating an action to destroy trypanosomes shut off in lacunae deep in the tissues.

The author has investigated the action of serum and of acid and alkaline solutions upon emetic and its trypanocidal action.

When serum is added drop by drop to 10 cc. of a saturated (5 per cent.) solution of emetic one obtains with the first drop an abundant and voluminous albuminous precipitate, which dissolves in slight excess of serum and also in alkalies or alkaline carbonates. This precipitate does not appear in solutions of antimony tartrate to which marine salt has been previously added nor in dilute solutions. In solutions of intermediate strength it is replaced by a cloudiness. If the albuminous precipitate be dissolved in excess of serum a clear solution results from which a precipitate is thrown down by acid solutions such as tartaric acid; this precipitate is not soluble in excess of acid but dissolves on the addition of alkali. It appears therefore that serum, thanks to its alkalinity, is able when present in sufficient quantity to prevent the precipitation of the albumen by emetic.

The alkalinity of serum, which is due especially to the bicarbonate and phosphate of sodium, in addition to neutralising the acidity of the emetic causes later the appearance of another precipitate, a fine white powder differing from the first and consisting of a mixture of calcium emetic and oxide of antimony. This precipitate does not appear instantly, its rate of development depending on the proportions of serum and emetic present. It forms more rapidly at 37° C. than at ordinary temperature. Insoluble in water it dissolves in hydrochloric acid and in tartaric acid and the solutions give the reactions characteristic of antimony.

These observations indicate the manner in which emetic behaves in the presence of serum. If a 2 per cent. solution of emetic be mixed with an equal volume of serum and injected after some seconds of contact it is observed that its trypanocidal activity is lessened, and furthermore that its irritant action on the tissues is diminished. The precipitate of antimony which is formed by the action of serum in excess on emetic, when washed and injected into an infected animal has a direct trypanocidal action. Tartaric acid has not *in vivo* any trypanocidal action, and the administration of ·01 gm. of this prevents the action of a therapeutic dose of emetic on an infected mouse. Tartaric acid is transformed as fast as it gets into the blood into tartrate of sodium, which has no trypanocidal action and for unknown reasons impedes the trypanocidal effect of emetic.

Hydrochloric acid (1 per cent. solution) is without trypanocidal action in mice. The carbonate and bicarbonate of sodium lessens the toxicity of emetic.

In vitro the carbonate and bicarbonate of sodium in isotonic solution have no action on trypanosomes and when added to emetic diminish, as does serum, the trypanocidal property of this substance. Tartaric acid (2 per cent. solution) exerts a distinct trypanocidal action *in vitro* owing to its acid character; previous neutralisation by sodium carbonate hinders this.

The results obtained indicate that in emetic it is the group SbO which exerts the trypanocidal property, since the tartrate is after neutralisation devoid of harmful action on trypanosomes; as an acid the latter has, however, among other advantages the property that it presents the antimony in a soluble and stable form in water.

The authors discuss the various ways in which emetic can be administered. Subcutaneously it is apt to produce severe irritation and sloughing. Intravenous injections of aqueous solutions are well tolerated by man and animals. When given per os the action of emetic is unsatisfactory and aleatory. Van Saceghem has introduced an intramuscular method which is not attended by abscess formation.

A fine suspension of emetic in olive oil* or liquid paraffin, to which camphor can be added, causes comparatively little irritation when given subcutaneously and is well tolerated intravenously by large animals. The addition to a 5 per cent. solution of emetic of an equal volume of serum, or of a solution of bicarbonate of sodium causes the emetic to lose its irritant character.

Although *T. cazalboui*, *T. ugandae* and *T. congolense* disappear from the peripheral circulation within a few minutes after intravenous, subcutaneous and intramuscular injections of emetic, the results in the case of other trypanosomes is not so satisfactory. Whilst recognising a special resistance of some species of trypanosomes the authors believe that the unsatisfactory results obtained in the treatment of certain infections is due to the fact that those trypanosomes, e.g., *T. gambiense* and *T. brucei*, which resist the action of emetic do so—at least in part—because of their tendency to lodge deep in lacunae in the organism and thus escape the action of the drug.

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* Tartar emetic in olive oil was injected by PLIMMER and his co-workers in 1908–9.

According to the experience of Van Saceghem it is possible to cure bovines infected with *T. cazalboui* with a single intramuscular injection of emetic. In order to obtain the maximum effect of emetic it is necessary to produce a profound action of this drug in the organism. This can be arrived at in various ways.

1. By administering massive doses dissolved in water. As such doses are toxic and depressant it is advisable to associate them with atropine.

2. By giving emetic in suspension in oil. This method prevents rapid diffusion, and permits the emetic to act deeply and at the same time allows of the use of large doses. The authors consider it of advantage to add camphor to the suspension. They recommend the following method of preparation. Emetic is ground up finely in a mortar with the oil, the uniform suspension is then poured into a flask containing a few glass beads and sterilised at 110° C. per 15 minutes. After cooling add the desired quantity of camphor (10–25 per cent.) preferably dissolved in a little ether. Before use the mixture should be shaken vigorously.

The paper closes with some remarks on the treatment of trypanosomiasis by emetic.

Suspensions of emetic in oil can be employed subcutaneously in large animals: 4–6 mgm. per kilo of emetic suspended in 100 cc. of camphorated oil (the camphor being 10–25 per cent.) are the quantities recommended.

Intravenous injections of 1 to 2 gm. dissolved in physiological serum give excellent results in large animals. In order to retard and prolong the action of emetic given intravenously the drug should be suspended in camphorated oil. The authors have injected into horses 1 gm. of emetic suspended in 20–25 cc. of oil containing 4–5 gm. of camphor without damaging the animals.

After intramuscular injection of 6 mgm. per kilo of emetic in 50 cc. of physiological serum the reaction is nil or transient and there is never any abscess formation. Intramuscular administration of suspension in camphorated oil acts well; the dose is 6 mgm. of emetic per kilo. A suspension of 2 gm. of emetic is made in 100 cc. of oil containing 10 to 20 per cent. of camphor.

W. Y.

LAVERAN (A.). **Surra, nagana ferox, nagana de l'Ouganda et infections dues au** *Trypanosoma rhodesiense*.—*Bull. Soc. Path. Exot.* 1916. Nov. Vol. 9. No. 9. pp. 731–738.

Reference is made to the difference of opinion amongst various workers as to the identity and non-identity of *T. brucei* and *T. rhodesiense*. BRUCE and his colleagues concluded mainly on biometric grounds that the two are identical. Laveran recalls his experiments showing that a ram and a sheep immunised to *T. brucei* (Plimmer and

Bradford) were susceptible to infection with *T. rhodesiense*; as a result of this and similar observations he considered that the two parasites are not identical. Under the name nagana have been confounded animal trypanosomiases of different nature and the question of the identity or non-identity of the virus of Zululand (Plimmer and Bradford), nagana ferox and the nagana of Uganda is important. STEPHENS and BLACKLOCK showed that the parasite of Nagana of Zululand is monomorphic whilst that of Uganda is dimorphic and hence is to be regarded as distinct; they gave the name *T. ugandae* to the latter parasite. MESNIL successfully infected with nagana of Uganda a goat immunised to the Zululand strain.

In the present experiments Laveran employed the following strains: the virus of surra of Mauritius which had been preserved in his own laboratory, the virus of nagana ferox of EHRLICH, the virus of nagana of Uganda obtained from BRUCE and finally *T. rhodesiense* received from the Runcorn Research Laboratory. Five goats and a sheep were inoculated with one or more of these strains.

Goat 1.—A healthy animal inoculated with the virus of Uganda; it became infected and died in the 66th day.

Goats 2 and 3.—These animals, which had been previously immunised against the virus of surra of Mauritius, were inoculated with the Uganda strain, became infected, and died on the 96th and 53rd days respectively.

Goat 4.—This animal was inoculated in September 1914 with nagana of Uganda, it became infected but recovered, and in June 1915 was immune to this trypanosome. It was inoculated in September 1915 with *T. rhodesiense* and became infected; in June 1916 it was immune to this parasite also. In August 1916 it was found to be immune to nagana ferox.

Goat 5.—Inoculated with nagana ferox in April 1915 and by September of the same year had acquired an immunity to this trypanosome. In January 1916 it was twice inoculated with nagana of Uganda, but did not become infected. In August 1916 inoculation with *T. rhodesiense* was successful.

A sheep which in August 1914 had acquired a solid immunity against nagana ferox was inoculated in November of the same year with nagana of Uganda and became infected and died.

Details of these observations are given at length. The author draws the following conclusions:—

As Goats 2 and 3, immune to surra of Mauritius, were just as susceptible to infections with nagana of Uganda as the normal animal Goat 1, it follows that these two strains of trypanosomes are not related to one another.

Because Goat 4, immune to nagana of Uganda, and Goat 5, immune to nagana ferox and also nagana of Uganda, were both susceptible to infection with *T. rhodesiense,* Laveran concludes that both the former strains are distinct from *T. rhodesiense.*

The facts that Goat 4 immune to nagana of Uganda and *T. rhodesiense* did not become infected after inoculation with nagana ferox and that Goat 5, immune to nagana ferox, was not susceptible to nagana of Uganda whilst a sheep immune to nagana ferox became infected and died when inoculated with nagana of Uganda, is explained by the author on the hypothesis that nagana of Uganda and nagana ferox are varieties of the same species. Laveran states in conclusion that he is unable to observe any morphological distinction between these two strains sufficiently marked to preclude this theory.

In the discussion which followed this paper MESNIL stated that the nagana of Uganda which when brought to Europe by BRUCE and also later (1911) when studied by STEPHENS and BLACKLOCK was polymorphic, was in 1913 becoming monomorphic, the short aflagellar forms tending to disappear.

Van SACEGHEM said that in nature *T. brucei* was polymorphic and that passage through the white rat caused the parasite to become monomorphic.

W. Y.

MACFIE (J. W. Scott). **The Results of Dissections of Tsetse Flies at Accra.**—*Report of the Accra Laboratory.* 1915. pp. 49–54. With 4 text figs. & 1 plate. London: J. & A. Churchill.

A few miles outside Accra *G. palpalis* and *G. longipalpis* occur in considerable numbers; the results of dissection of 75 of the former and 8 of the latter are given in a table.

The parasites found in the proboscis of the single infected *G. longipalpis* were small delicate Crithidia, probably developmental forms of *T. vivax.*

Of the eleven *G. palpalis* found to be infected with trypanosomes eight were males and three females. Three of the flies had an infection of the gut and salivary glands, one of the proboscis and gut, three of the proboscis only, and four of the gut only. In five cases (one proboscis infection, one gut and proboscis and three gut and salivary glands) animals were inoculated with the infected parts but no infection resulted. Feeding experiments conducted with the same flies before dissection were likewise negative. In view of these negative results it is difficult to decide what trypanosomes the developmental stages in the flies represented. The commonest trypanosomes at Accra are *T. pecaudi* (*T. brucei* of Uganda), *T. vivax* and *T. congolense.* Probably therefore the infection of the proboscis was *T. vivax*, and those of the gut and salivary glands *T. pecaudi*; none of the infections resembled stages in the development of *T. congolense.*

Several other infections were found in *G. palpalis.* In the gut of one male were spirochaetes similar to those discovered in the gut of a *G. tachinoides* at Eket [this *Bulletin,* Vol. 5, p. 293]; inoculation into a guinea-pig was without result.

Fungal infection.—One male *G. palpalis* was found to be infected with a fungus. Superficially the fly looked healthy, but the abdomen was rather swollen and pale coloured posteriorly. A large cheesy mass was expressed consisting of a dense network of fungal hyphae. The fungus was restricted to the abdomen. In general appearance the fungus was not unlike a tinea; possibly infection was contracted by biting some animal suffering from a skin disease of this description. The fungus is illustrated by a plate.

Sporocysts.—Lying free in the abdominal cavity of two *G. palpalis* cysts were found. The smallest measured was 384μ in diameter; it consisted of a thin wall enclosing a spherical body, composed of granular material with a clearer periphery that measured 304μ in diameter. In larger cysts a great number of columnar prominences were seen to have budded off on the periphery of the spherical body and the central granular mass itself seemed to show divisions into a number of circular or ovoid masses. Finally cysts measuring 400–560μ in diameter were seen, filled with innumerable sporocysts, each 36μ in diameter and containing about 40 sporozoites. The sporozoites were sickle-shaped bodies measuring 23μ by 4μ; each contained a nucleus near the centre. Diagrams illustrate these points.

Reference is made to the fact that CHATTON and ROUBAUD have described cysts in the abdominal cavity of *G. palpalis* and that these authors considered them to be probably the sporogonic stage of a haemogregarine of a reptile or lizard [this *Bulletin*, Vol. 2, p. 55].

W. Y.

RITZ (Hans). **Ueber Rezidive bei experimenteller Trypanosomiasis. II. Mitteilung.** [On Relapses in Experimental Trypanosomiasis. 2nd Communication.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1916. Sept. Vol. 20. No. 17. pp. 397–420.

The strain of trypanosomes employed by Ritz was, as in his previous work [see this *Bulletin*, Vol. 4, p. 265], *T. brucei* (PROWAZEK). As a result of the observations recorded in this paper it appears that trypanosomiasis must be regarded as a typical relapsing infection. The whole mechanism of relapse formation is, as is demonstrated anew in the present work, governed by the variability of the parasites, a fact which was first shown by EHRLICH. The trypanosomes protect themselves against the action of anti-bodies by the formation of new races. Of great importance for the course and duration of a disease is the number of possible variations the parasite is capable of; in some infections (relapsing fever) this is limited, but in others, especially in trypanosomiasis as is shown by the author's investigations, it is inexhaustible. In the first case, owing to the limitation of the number of possible variations of the parasite, the infection is destroyed by normal immune body formation; whilst in the second case, owing to the unlimited capacity of the parasite to produce new races, exhaustion of the antibody forming power of the organism occurs and death results.

It is clear that the old laboratory strains of trypanosomes which one is accustomed to regard as original strains (*Ausgangstämme*) are really nothing of the sort, but in reality relapse strains which have been obtained by inoculation of mice from an infected animal and only after year long passages through mice have been passed on to a new species. In a similar manner the parasites with which Glossina infects itself are really relapse strains; that these parasites during the very distinct protoplasmic changes which occur in their sexual development in the insect also undergo modification in their receptor apparatus is more than probable, but it is yet to be proved that this metamorphosis results in a race with a simple receptor apparatus.

For experimental details this paper, which is of a rather technical character, should be consulted in the original by those interested.

W. Y.

PLATAU (Lilli). **Untersuchungen über die Trypanozide Substanz des menschlichen Serums bei Gesunden und Leberkranken.** [Investigations on the Trypanocidal Substance of Human Serum in Health and in Disease of the Liver].—*Zeitschr. f. Hyg. u. Infektionskr.* 1916. Vol. 81. pp. 401–431.

In the experiments described in this paper the author used mice infected with nagana (PROWAZEK). At the time of inoculation of the virus the animals were injected intraperitoneally with normal serum and with serum from patients suffering from various affections of the liver. The results of these prophylactic injections are set forth in a series of tables.

The conclusions are:—

The content of human serum in trypanocidal substances undergoes not inconsiderable fluctuations even in healthy persons.

In the process of curing experimental trypanosomiasis by injections of human serum there are involved specific trypanocidal immune bodies.

In circumscribed affections of the liver the trypanocidal content of human serum is not lessened.

In very icteric individuals the trypanocidal substances of the serum are diminished in a high degree and frequently are completely lost.

The addition of bile to active human serum *in vitro* causes the trypanocidal substance to disappear; the taurocholates are not concerned in this process.

In diffuse liver conditions where icterus is not a feature the trypanocidal substances in the serum are only diminished when the disease is reaching its final stage.

W. Y.

ITURBE (Juan) & GONZALEZ (Eudoro). **A New Trypanosoma of the** *Vampirops lineatus*.—7 pp. With 2 plates. Laboratory of Dr. Juan Iturbe. 1916. Caracas, Venezuela: Tip. Cosmos.

A trypanosome, which the authors consider to be a new species, was found in one of 65 bats examined. The parasite has a free flagellum. Seven specimens were measured and details of the measurements are given: Average length, 19·5μ; maximum, 20·5μ; minimum, 16·6μ. Divisional forms were seen in the peripheral blood; in organ smears the authors claim to have seen evidence of schizogony. The name *T. lineatus* is given to the parasite. The note is illustrated by a coloured plate. [Both the note and the plate are somewhat crude. Figure 3 in the plate which is labelled "Trypanosoma without undulating membrane and without flagellum" represents a parasite with a well marked undulating membrane, whilst Figures 4 to 9 which are intended to represent different stages of schizogony appear to the reviewer more like distorted or degenerated forms than anything else.]

W. Y.

KUHN (Philalethes). **Die Geschichte der Schlafkrankheit in Kamerun und ihre Lehren.** [The History of Sleeping Sickness in the Cameroons and its Lessons.]—*Zeitschr. f. Hyg. u. Infektionskr.* 1916. Vol. 81. pp. 69–137.

This long paper gives a very full account of sleeping sickness in the Cameroons. The results obtained by the various Commissions sent out by the French and German Governments to study sleeping sickness are referred to in considerable detail. [These reports have already been summarised in this and the *Sleeping Sickness Bulletin.*]

W. Y.

CORRECTION.

On page 264 of Vol. 8 of this *Bulletin* in a summary of the Nyasaland Protectorate Sleeping Sickness Diary, Part 25, it was stated that Dr. DAVEY found trypanosomes by examination of blood smears in four antelope out of 25 wild animals shot, i.e., 16 per cent., and that the Sleeping Sickness Commission found 31·7 per cent. infected "in a a part of the same area." The last seven words are incorrect. The Sleeping Sickness Commission results were obtained in the fly country below Kasu Hill, i.e., in a portion of the Proclaimed Area of the Dowa District, whereas Dr. DAVEY'S were obtained in the Ngara Sub-district of the Marimba District, which, as Davey points out in a letter, had, until recently, been regarded as free from trypanosome infection.

A. G. B.

TYPHUS.

HALL (Horace C.). **Typhus Fever.**—*Military Surgeon.* 1916. Nov. Vol. 39. No. 5. pp. 474–490. With a map.

This very interesting paper deals more particularly with typhus as it appears in outbreaks on the Mexican frontier. A short historical survey of the epidemiology of typhus is followed by an account of "Rio Grande Fever," the name under which typhus has apparently been known for some years in Texas. In 1915, the present author drew attention to the fact that this malady was in reality a mild form of typhus. During 15 years' residence in Mexico, he had opportunities of treating hundreds of cases. The malady is considered to be endemic in the mountainous tablelands of Mexico, and to have existed there since the time of the Spanish conquest.

The precautions taken by Dr. HUSK, one of the pioneers in America of typhus investigation, are given. They include the use of silk garments for underwear, the use of rubber elastic around the ankles, rubber gloves coming up over the shirt sleeve and elastic bands to make the union impassible to vermin, three baths daily, the last being of gasoline, and clean sheets, fumigated and disinfected before use on the bed each day.

From personal experience of epidemics, the author states that "granting that the body louse does convey the infection, that the head louse and bed bug are suspicious conveyors, it has not been conclusively proved to the writer that vermin are the only means of conveying the disease." The predisposing causes of typhus are briefly famine, filth, overcrowding, and conditions favourable for the thriving of vermin. Climate influences the virulence of infection. The relatively mild form of typhus known as Brill's disease flourishes in New York City during the warmer months; at the Rio Grande border of Texas, which is practically at sea-level, there is the Rio Grande fever, which is an attenuated form of the virulent typhus of Mexico. Age, sex and occupation have little influence as predisposing factors.

The period of incubation varies from 5 to 15 days, and the author wishes "to especially call attention to the text-book positive statements, which are in error, that the incubation period is a fixed time of not less than twelve days," so far as Mexican typhus is concerned. There is nothing distinctive in the morbid anatomy of this form of typhus.

Three distinct forms of typhus occur:—The fulminating form, in which the patients are attacked and die very suddenly, even before the rash or any of the typical symptoms appear; the "text-book" form of typhus; and the attenuated form known as Brill's disease and as Rio Grande fever, the latter being more virulent than Brill's disease. The fulminating form occurs only during an epidemic; the cases resemble those of cerebro-spinal meningitis. The fulminating or the milder form of typhus may arise from the usual epidemic form. So far, no virulent case originating from Rio Grande fever has been observed. The latter fever differs from the epidemic form only in the more severe symptoms. In the milder form, the eruption rarely goes on to the haemorrhagic or purplish stage. The degree of bacterial thrombosis depends on the virulence of the infection. Severe involvement of the central nervous system is not seen. " The weakness is never so marked, but the general debility is out of all proportion with the degree of illness indicated by the other symptoms."

The preventive measures against the importation of typhus into Texas from Mexico are described. Foot passengers who reached Texas from Mexico were mostly immune. The railway communication with Mexico presented the greatest difficulty. When typhus broke out in Texas, it was the virulent epidemic Mexican form, and not the attenuated form already known there. The prevention of ingress into the State of any louse-infested person, along a frontier consisting of a fordable river of 2,000 miles line, was a great undertaking. Imported labour presented an added difficulty. Arrangements to prevent infection were in progress.

Many most interesting experiments were performed by the author on body lice. He found that live lice were still clinging to clothing after it had been washed in soap and water; that live body " lice, when placed in a bottle with head lice, bed bugs, and raw meat, will first kill and devour the head lice, then the bed bug, and after the raw meat has been devoured, become cannibals to the extent of the survival of the fittest." The life-history of the body louse is outlined.

The procedure for louse eradication in Texas is fully described. For body lice, the clothing is placed in boiling water for 20 minutes, or thoroughly dipped in a mixture of vinegar and kerosene. Where many suspects are being handled, their clothing and baggage are placed in an autoclave, and kept there for 15 minutes, under not less than 90 pounds pressure. Special measures were adopted for dealing with head lice where clipping of the hair was not permissible, vinegar and kerosene mixture being forced through the hair by a garden spray at a pressure of 90 pounds by means of compressed air. A search through the baggage from Mexico, " even that of the better class Americans, who have had Mexican washwomen, has revealed that lice, bed bugs, and fleas are frequently found." Bad application of fumigation has caused it to fall into disrepute, but sulphur fumigation if properly applied, and for a sufficient time, will kill rats, bed bugs, lice and fleas. Formalin fumigation is of little use. Hydrocyanic acid fumes are efficient, but the danger to life of men is against its use. The author has obviated this by the use of a simple fumigation plant.

> " An old box car can easily be arranged as a plant, all openings being sealed up. The following mixture is used for the generation of this gas: Potassium cyanide and commercial sulphuric acid each an ounce to two and a half ounces of water, for each hundred cubic feet of space to be fumigated, including that occupied by the material to be disinfected. Place the KCN in a piece of cheesecloth, or, better still, in a large castor oil gelatine capsule, drop it into the mixture of H_2O and H_2 SO and get out quickly. Allow the quarters to become well ventilated before being opened."

With regard to treatment, the author " controls the fever with baths, the delirium with bromides and an ice cap, and gives egg albumen in water, even though it has to be placed in the stomach through a tube, passed through the nose." Immunising vaccine treatment, so far, has been of little use, having been prepared from the less virulent Brill's disease.

The author tried to find why " live lice could be found in empty freight cars which had been used to transport Mexican troops, weeks before being used to import merchandise" into Texas. His experiments had some astonishing results, which may be of far reaching practical importance in combating louse-borne diseases. They are summarised by him as follows:—

"1. Body louse, taken from Mexican baby, was placed in bottle with head louse, taken from the same baby. At end of second day, body louse had eaten head louse. Two head lice were fed to this same body louse daily for three days.

"2. The same experiment was made on the same body louse, the crab louse being fed to it for three days. Then both head and crab lice were placed in the bottle with the same body louse and were eaten, the head lice being devoured first.

"3. Small black ants were next offered, and were readily disposed of.

"4. Daily, for three days, two bed bugs were consumed.

"5. Young body lice were placed in the bottle with the same body louse, and were quickly eaten.

"A piece of raw beef was then offered and eaten, until the thirty days' rations were completed.

"The louse used was a female, taken at random. During the time she was in the bottle, no nits were deposited. The experiment obviously explains the reason why typhus infection remains dormant in certain isolated locations and also that lice in freight cars, once infected with typhus, would be a source of danger, extending over a longer period than the louse has been supposed to remain alive on other than human blood."

A. Porter.

PUBLIC HEALTH REPORTS. 1917. Feb. 2. Vol. 32. No. 5. pp. 197–198.—**Typhus Fever. Measures for the Prevention of its Introduction at El Paso, Tex.**

The presence of typhus fever in epidemic form throughout Mexico has caused the Public Health Authorities to institute measures with a view to preventing its introduction into the border towns of the United States. A chain of quarantine stations has been placed along the Mexican borders of the states of Texas and Arizona and all incoming travellers are submitted to a thorough inspection. If need be, their persons are freed from vermin by the application of gasoline or a mixture of vinegar and kerosene, and their clothes and luggage are sterilised by means of steam.

In order to prevent "the interstate spread" of the disease from El Paso [in which place several deaths from this cause are reported] and as an additional precaution "the railroad companies have been instructed not to issue transport to Mexican labourers unless they present a certificate of disinfection from the Public Health Service officer in charge of the border quarantine." During the week ending January 13th, 1917, 41,331 persons were examined at the quarantine posts along the Texas border, and of these, 2,406 were treated for the purpose of freeing them from vermin. Admission was refused in the case of 21 sick persons.

R. P. Cockin.

DORENDORF. **Beobachtungen bei einer kleinen Fleckfieberepidemie während des Feldzuges in Serbien.** [Observations on a Small Epidemic of Typhus during the Campaign in Serbia.]—*Deut. Med. Woch.* 1916. Mar. 23 & 30. Vol. 42. Nos. 12 & 13. pp. 345–347 & 375–379. With 10 charts.

This is an account of a small epidemic of typhus fever, which broke out amongst the troops operating in Serbia. The cases generally were of a mild type, although more severe ones, several of which terminated fatally, are noted.

Cardiac dilatation, due to parenchymatous changes in the heart muscle, was frequently observed in the more severe cases. Dorendorf however regards the quality and frequency of the pulse as the best guide in prognosis.

In all the cases examined during the febrile stage of the disease, he found the organisms described by PROWAZEK to be present in the blood. These organisms were found in the plasma of the polymorphonuclear and mononuclear leucocytes, either singly or in pairs.

Blood films stained with Giemsa show these organisms to be rounded bodies, having a special affinity for the red stain, surrounded with a lightly tinted halo.

During the febrile period, a polymorphonuclear leucocytosis was regularly noted, which gave place to a lymphocytosis after the temperature had fallen. Eosinophile cells were absent from the blood throughout the course of the disease.

The writer observes that nuclear variations were a marked feature in the blood picture of the severe cases and were also seen in the milder cases at the height of the fever. A number of temperature charts illustrate the cases which are quoted and three are given which show the effect of the intravenous injection of Nucleo-Hexyl.

R. P. C.

SOUCEK (Alfred). **Ueber das Fleckfieber im Kindesalter.** [Typhus in Childhood.]—*Wien. Med. Woch.* 1916. Nov. 25. Vol. 66. No. 48. pp. 1808–1809.

In this paper the writer calls attention to the mild type of typhus fever which is frequently met with in children under the age of fourteen years. He states that during five months he had in his care 23 cases of this disease in children under this age and that all made good recoveries. During the same period 92 cases of the disease in older patients showed a mortality of five.

The rash in the milder cases is generally transitory and may easily be overlooked, whilst a prominent symptom may mask the true nature of the infection.

The danger of these cases to the community when unrecognised, and especially when they exist in a community near to, or in which troops are stationed, is apparent.

R. P. C.

ŠIMIČEK (Josef). **Wert der künstlichen Blutstauung als diagnostisches Hilfsmittel bei Fleckfieber.** [Value of Artificial Stasis in Diagnosis.] —*Wien. Klin. Woch.* 1916. Sept. 28. Vol. 29. No. 39. pp. 1236–1238.

In this article is described an ingenious method of precipitating the rash in early or late cases of typhus by means of the production of an artificial blood-stasis in one or other of the limbs. This is brought about by the application of a tourniquet, and the author claims that the rash is invariably called forth, however early in the disease the test is made.

The use of this method should prove of value in the differential diagnosis of early and doubtful cases.

A similar phenomenon is produced under identical circumstances in the case of cerebro-spinal meningitis.

R. P. C.

JACOBSTHAL (E.). **Eine Anregung zur Anstellung von Kutisreaktionen bei Fleckfieber.** [Wanted a Cuti-Reaction in Typhus.]—*Deut. Med. Woch.* 1916. Sept. 7. Vol. 42. No. 36. pp. 1093–1094.

The writer of the above article suggests that a skin reaction, similar to that obtained by von Pirquet's method in tuberculosis, would result from the injection of infected louse extract in typhus fever patients.

He considers that, in the present uncertainty as to the exact organism which produces the disease, this is the mode of procedure which is most likely to yield good results.

The need for some such simple method for confirmatory and diagnostic purposes is manifest.

R. P. C.

MEINICKE. **Ueber die Brauchbarkeit der bacteriologischen Typhusdiagnostik zur Differentialdiagnose zwischen Fleckfieber und Typhus.** [The Value of Widal's Reaction in the Diagnosis between Typhus and Typhoid.]—*Deut. Med. Woch.* 1916. Oct. 5. Vol. 42. No. 40. pp. 1214–1217.

Meinicke in the above article pleads for a more general use of Widal's agglutination test in the differential diagnosis of typhus from typhoid fever.

Many of the typhus cases are atypical, and confusion must arise unless some sure test to separate the two diseases is constantly in use. He cites a series of cases which he had examined in support of his appeal, in which he found that 25 per cent. were being treated for typhus on an erroneous diagnosis.

R. P. C.

BABES (V.). **Sur le diagnostic différentiel entre le typhus exanthématique et certaines formes hémorragiques de méningite cérébrospinale.**—*C. R. Soc. Biol.* 1916. Oct. 21. Vol. 79. No. 16. pp. 857–860.

Cases of typhus occurred in Bucarest at the end of 1915 and beginning of 1916 among the civil population, while in the military barracks there was a fever showing strong resemblances to it. These latter cases were atypical, the fever irregular and less severe, the patients showing intense headache and diarrhoea. After the second day, roseolae and petechiae appeared. Several cases were cured, though the treatment is not stated. Details are given of three cases of meningitis, two of which died. The autopsies are given in detail and many of the features are not new. The chief new features consists of lesions in the skin at the level of the petechiae and especially of the haemorrhagic roseolae. The most characteristic lesion is found in the basal layer of the epithelium. Here there is an agglomeration of round bodies or diplococci, varying in size and colouration, and Gram-negative. They are no doubt meningococci, some multiplying and some degenerating. From here, they invade the epithelial layers and are enclosed in the intracellular lymphatics. They penetrate the Malpighian layer and deform the nuclei of its cells. The meningococcus, while circulating in the blood, is more especially localised at the level of the roseolae. The cases are not typhus complicated by meningeal symptoms but cerebro-spinal meningitis with localisation of the meningococcus in the skin. This localisation is very important in practical epidemiology, as otherwise it would be very difficult to differentiate such cases from typhus.

A third case came under observation and was treated by the removal of cerebro-spinal fluid and the replacement of it by 20 cc. of anti-meningococcal serum. This was repeated for three days and, five days after, the man was clearly convalescent. In this case, the meningococcus was found in the cerebro-spinal fluid.

A. P.

HANSER (Robert). **Zur Aetiologie des Fleckfiebers.**—*Deut. Med. Woch.* 1916. Oct. 12. Vol. 42. No. 41. p. 1254.

TEICHMANN (Friedrich). **Zur Behandlung des Fleckfiebers mit Silbermitteln.**—*Ibid.* pp. 1256–1258. With 4 charts.

TOEPFER (H.). **Zur Aetiologie und Behandlung des Fleckfiebers.**—*Ibid.* Nov. 9. No. 45. p. 1383.

In the first of the above papers Hanser confirms TOEPFER's discovery of bacteria-like forms in the intestinal cells of lice fed on typhus fever patients.

The two latter papers are in complete agreement as to the value of "Fulmargin"—a silver colloid preparation—in the treatment of this disease. The drug is administered intravenously and the dose administered is 5 cc. [The strength of the solution injected is not stated.] Repeated injections are necessary up to a maximum of 8–10, although Teichmann records as many as 15–20 having been given without any ill effect upon the patient.

R. P. C.

MUNK (Fritz). **Ueber die Wirkung und Anwendung des "Nucleo-Hexyl" bei Fleckfieber.** [The Action and Employment of Nucleo-Hexyl in Typhus.]—*Münch. Med. Woch.* 1916. Aug. 22. Vol. 63. No. 34. pp. 1239–1241. With 11 charts.

The author has investigated the action of Nucleo-hexyl in cases of typhus. The compound is one of nucleic acid with hexamethylenetetramine. The main conclusions reached as a result of his work are summarised. Nucleo-hexyl is not a specific agent against the excitant of typhus. It has some action in influencing the general processes of immunisation, similar to those of serum and vaccine treatments in other acute infectious diseases. The treatment can be given to cases with severe general symptoms. The objective action of the drug is usually not immediately perceptible. It can be tried in other acute infectious diseases.

Intravenous inoculation is used, a ten per cent. solution in sealed ampoules of ten cc. being apparently the dose. Immediately after the inoculation, there is a short rise in temperature up to ½° C., and in from 12 to 24 hours there is a fall, often accompanied by shivering, perspiration and in some cases digestive derangements. The best results have been obtained from inoculations made between 4 and 6 o'clock in the afternoon. A second injection is given on the next day or on the second day after the first, and the injection solution should be at a temperature of about 30° C.

A. P.

COGLIEVINA (B.). **"Dispargen"- Therapie des Fleckfiebers.**—*Deut. Med. Woch.* 1916. July 6. Vol. 42. No. 27. pp. 813–815.

The above paper is a record of the satisfactory results which the author has obtained by the use of "Dispargen"—a silver colloid preparation—in the treatment of typhus fever.

The drug was administered intravenously as a 2 per cent. solution, and 5 cc. of this solution was the dose usually employed. It was necessary to repeat the injections several times in the course of the treatment of each case.

Neither cardiac nor renal troubles complicated its use, and a case is quoted in which a satisfactory result was obtained, although pneumonia was a complicating factor.

Antipyretics were not used in the course of the disease, in those cases treated by these injections.

The notes on five cases, and the progress made under treatment, are incorporated in the paper.

R. P. C.

HIRSCH (C.). **Zur Therapie des Fleckfiebers.**—*Deut. Med. Woch.* 1916. May 18. Vol. 42. No. 20. p. 599.

Hirsch states in this paper that he has had extremely good results in the treatment of typhus fever from the administration of repeated small doses of quinine. He recommends the following procedure:—

Quinine hydrochloride 0·2–0·25 [gramme] to be given five or six times in the 24 hours. At the commencement of the illness, some preparation of digitalis should be given until the patient has had the equivalent of 1·0 gm. of Digitalis folia. In addition, even when the heart is sound, two intramuscular injections of Ol. camphorat. fort. are to be administered daily along with the quinine.

In cases of heart failure, due to enfeeblement of the vaso-motor control, larger doses of camphor in conjunction with caffein should be employed. Wherever possible, Hirsch recommends the treatment of typhus fever patients in the open air.

R. P. C.

DA ROCHA-LIMA (H.). **Beobachtung bei Flecktyphusläusen.** [Observations on Typhus-Infected Lice.]—*Arch. f. Schiffs u. Trop.-Hyg.* 1916. Jan. Vol. 20. No. 2. pp. 17–31. With 1 plate.

The present paper deals with the excitant of typhus fever as described by PROWAZEK in the body louse. The author has examined both smears and sections of lice taken from patients suffering from typhus, and also examined similar preparations of lice from normal persons.

The microörganisms found in typhus-infected lice had resemblances with bacteria and with other schizomycetes. Variations in their morphology occur, some being ellipsoidal, coccus-like or rod-shaped. It was found that the organisms did not stain well with the usual bacteriological stains, and that the best results were obtained with Giemsa's stain. The bodies stain like spirochaetes, the colour being a clear ruby red, bacteria staining much deeper or at times blue. The bodies are considered to be bacteria-like organisms. The smaller forms measure $0{\cdot}3\mu$ by $0{\cdot}4\mu$, and some somewhat biscuit-shaped double forms, in stages of division, were $0{\cdot}3\mu$ by $0{\cdot}9\mu$. Experiments with respect to the filterability of the typhus excitant have so far given negative results, a Berkefeld V filter being used. Attempts at cultures on various agar media have also been unsuccessful.

The frequency of the occurrence of the bodies in lice is discussed. Most of the lice from prison camps were considered to be infected, while it was thought highly probable that all lice from typhus patients were capable of causing disease. Experimental transmission of typhus virus to monkeys by bites of lice has given unsatisfactory results. Eight out of ten attempts to transmit the virus to guineapigs, however, were successful. The quantity of material inoculated to man by the bite of a louse was shown to be very small, a female louse ingesting 0·00089 grams of blood, while a male louse sucks 0·000325 grams. 3 to 4 cc. of blood from a typhus patient are required to produce infection when inoculated to a guinea-pig. The louse does not transmit typhus mechanically, but the author has established that the bodies he has described multiply actively in the louse. The virus can be maintained in guinea-pigs, and the identity of the louse virus and that of human beings has been established by cross-immunity experiments with guinea-pigs.

By the examination of a number of sections of typhus lice and comparison with normal lice, it was found that the tiny bacillus-like bodies were present in great masses in the cells of the stomach, in the alimentary canal, and also in the kidney-shaped salivary glands of infected lice, and not in normal lice.

The author considers that the bodies that he has described as the excitant of typhus are really the etiologic agents because he has transmitted the disease by means of them, and they have been found present in the bodies of typhus lice. The plate, of four figures, shows in the first figure, the appearance of the bodies, while two figures depict their appearance in sections of the gut of the louse, and the fourth figure shows the appearance of the normal louse gut in section.

A. P.

DA ROCHA-LIMA (H.). i. **Untersuchungen über Fleckfieber.**—*Münch. Med. Woch.* 1916. Sept. 26. Vol. 63. No. 39. pp. 1381–1384. With 3 figs.

ii. **Zur Aetiologie des Fleckfiebers.**—*Deut. Med. Woch.* 1916. Nov. 2. Vol. 42. No. 44. pp. 1353–1354.

The former of these papers gives an account of the investigations which the writer has carried out on the subject of typhus fever, its cause and transmission.

His results are briefly stated as follows :—

1. In one experiment, out of 13, he was able to satisfy himself that transmission of the disease was conveyed by a louse which had itself acquired the virus by hereditary transmission.

2. Repeated experiments with healthy lice demonstrated the fact that feeding upon typhus convalescents did not render the lice infective.

3. The virus circulating in the blood of typhus fever patients is so scanty, immediately after the fall of the temperature, that it is unusual for lice fed upon the patients at that time to become infected.

4. During the febrile stage of the disease one feed upon the patient is sufficient to infect lice.

5. A feed upon a typhus patient on the fourth day of the disease causes the appearance of " Rickettsia " infection in the louse four days afterwards.

That the louse was infective was proved by animal experiments and established by microscopical examination.

The manner in which the feeding experiments were carried out and the apparatus employed are described in the article.

The second of the papers is a controversion of statements made by TOEPFER regarding the nature of the *Rickettsia Prowazeki* organisms found in the intestinal cells of infected lice.

R. P. C.

TOEPFER (H.) & SCHUESSLER (Hermann). **Zur Aetiologie des Fleckfiebers.**—*Deut. Med. Woch.* 1916. Sept. 21. Vol. 42. No. 38. pp. 1157–1158. With 3 figs.

Toepfer and Schuessler give an account in the above paper of their investigation on the aetiology of typhus fever. The following summary gives the main conclusions at which they arrived.

1. Bacteria-like organisms, whose form and appearance are characteristic, are constantly present in the intestinal canals of the body lice removed from typhus fever patients. These organisms are unlike any other parasite of the louse.

2. These organisms are found in the louse after it has been fed upon the blood of a typhus fever patient. Controls, not so fed, remained sterile.

3. Feeding experiments demonstrated that a patient who infected lice with this organism during the course of the disease did not infect them during the post-febrile period.

4. The eggs and progeny of infected lice are considered by the writers not to be infected.

5. The injection of the contents of the gut of an infected louse into a healthy guinea-pig produces a febrile condition similar, both as to course and incubation period, to that produced by the injection of the blood of a typhus fever patient.

6. Multiplication of the specific organism continues to take place in the gut of the louse and it remains infective indefinitely.

R. P. C.

TOEPFER (H.) **Der Fleckfiebererreger in der Laus.** [The Agent of Typhus Infection in the Louse.]—*Deut. Med. Woch.* 1916. Oct. 12. Vol. 42. No. 41. pp. 1251-1254.

The head and body louse are both claimed by Toepfer to be capable of functioning as the transmitting agents of the organism producing typhus fever.

Smears made from lice, which had previously fed on the blood of infected patients during the febrile stage of the disease, were found to contain nearly pure cultures of the organism which Toepfer regards as the undoubted cause of the disease.

The author states that lice fed upon convalescent patients do not become infected, and patients free from lice are not considered by him to be a source of infection to their neighbours.

The chief sources of infection are stated to be the excrement of infected lice and the crushed bodies of such lice upon the skin and mucous surfaces. Abrasions and scratches of the skin are supposed to afford the means of entry to the circulation.

R. P. C.

CSERNEL (Eugen). **Ueber die Morphologie des Fleckfiebererregers.**—*Wien. Klin. Woch.* 1916. Dec. 28. Vol. 29. No. 52. pp. 1643-1646. With 5 text figs.

An interesting account of the various organisms which have been cited as the specific cause of typhus fever.

The polymorphism exhibited by one of these organisms, when grown on various culture media, is adduced to explain to some extent the diversity of opinion which has been expressed on the morphology of this organism.

The confusion has been still further increased by the fact that this organism appears different in form when stained with some of the commoner staining reagents.

Reproductions of five microphotographs illustrate the article and should be referred to by those interested.

R. P. C.

HAMDI (H.). **Ueber die Ergebnisse der Immunisierungsversuche gegen Typhus exanthematicus.** [The Results of Immunisation Experiments in Typhus.]—*Zeitschr. f. Hyg. u. Infektionskr.* 1916. Oct. 20. Vol. 82. No. 2. pp. 235-242. With 1 chart.

Professor Hamdi here gives an account of the work which he and others have been carrying out in Turkey with the object of finding a means of inducing immunity against typhus infection in the human subject. He quotes one series of 120 cases in which each person received a subcutaneous injection of 5 cc. of defibrinated, but not inactivated, blood taken from convalescents from typhus fever. One of the series contracted the disease 14 days later, and died. Another also developed the disease but recovered.

Another series of 310 cases is quoted in which each was injected subcutaneously with 5 cc. of defibrinated, non-inactivated blood taken from typhus fever cases during the exanthem stage. Of this series 174 [i.e., 56 per cent.] developed the disease, and of these 49 [i.e., 28 per cent.] died.

The shortest incubation period noted was five days and the longest 23 days. The usual period for incubation was 12 days.

The subcutaneous injection of typhus serum, inactivated with chloroform, was experimented with by members of the German Red Cross at Ersindjan. Of the 20 persons injected with this serum none contracted the disease from its use. Immunity, however, was not induced, as one of these cases subsequently acquired the disease. Professor Hamdi claims the best results from the injection of defibrinated, inactivated blood from cases showing a florid exanthem. He inactivates the blood either by keeping it at 60°–62° C. for 30 minutes or in the cold for 24–48 hours.

R. P. C.

RELAPSING FEVER AND OTHER SPIROCHAETOSES.

Duchamp. La fièvre récurrente chez les Serbes.—*Progrès Méd.* 1917. Jan. 13. No. 2. pp. 10–13. With 3 charts.

During six months spent in one of the hospitals attached to the Serbian Army, Major Duchamp had under his care seventy-one cases of relapsing fever, all of which made good recoveries.

As the type of the disease met with in Serbia appears to be peculiar in several of its features, and agrees with none of the described types in all its characteristics the author publishes his observations for general information.

The onset of the attack was invariably abrupt, the temperature rising rapidly to 39° or 40° C. This temperature was maintained throughout the initial attack, which was usually a period of 3–3½ days. Rarely, this attack was prolonged to four days, but in no case exceeded four and a half.

The daily variations of temperature during the febrile period rarely exceeded 1° C. and this variation was usually confined between the limits of 39°–40° C.

Following the initial attack the temperature fell rapidly to below the normal level, and throughout the apyrexial period a subnormal temperature was the rule.

This apyrexial period was usually (70 per cent. of the cases) of seven to eight days duration. At the end of the seventh or eighth day the temperature again rose abruptly to 39°–40° C., and the period of relapse was entered upon. The features and duration of the relapse are similar in all respects to those observed in the initial attack. Similarly, at the termination of the relapse, the temperature again descends to the subnormal level, and the normal temperature is only regained towards the end of the period of convalescence.

More relapses than one were rarely observed. The pulse rate throughout the course of the disease is relatively slow. During the febrile periods it is accelerated, but not in proportion to the rise in the temperature whilst, during the periods of hypothermia, the rate is constantly between fifty-four and sixty-four per minute.

Muffling of the heart sounds, especially of the first, is frequently noted during the attacks, and embryocardia is not uncommonly observed. Following the attacks, bradycardia and embryocardia may be marked features. The spleen is invariably enlarged during the whole duration of the illness, and may descend as much as three fingers' breadth below the costal margin. This organ, however, varies considerably in size at various stages in the disease, being at its maximum just previous to the fall in temperature at the end of the febrile periods. It is noted that this maximum enlargement of the spleen corresponds with the disappearance of the spirochaetes from the peripheral circulation. It should here be stated that spirochaetes are extremely scanty, even during the febrile stages of the disease.

Enlargement of the liver is also a fairly constant feature. The enlargement is usually of slight degree, but it may be palpable in some cases. The spleen rapidly recovers its normal size, after the termination of the disease, but the liver may be palpable for a much longer period. Jaundice is rarely observed and, when present, is not a marked feature.

Rectal haemorrhages and, more frequently, epistaxis call for treatment in some of the cases. The author notes that these haemorrhages are most frequently observed at the period of maximum temperature, just previous to the crisis.

Syncopal attacks were not a feature in any of the author's cases. He states that he guarded against this complication by the administration of daily injections of camphorated oil. The oil was given in large doses, 10–30 cc.

In the absence of salvarsan the treatment was largely symptomatic.

Major Duchamp emphasises, as characteristic features of the epidemic, the regularity of the duration of the attack, the nearly "mathematical exactness" of the duration of the apyrexial period intervening between the initial attack and the relapse, and the hypothermia and slowness of the pulse during this latter period.

In view of these clinical peculiarities the author questions whether Serbian spirochaetosis should not be regarded as a clinical entity.

R. P. Cockin.

Toepfer (H.). **Die Uebertragung der Rekurrens durch Läuse.** [The Transmission of Relapsing Fever by the Louse.]—*Münch. Med. Woch.* 1916. Oct. 31. Vol. 63. No. 44. pp. 1571–1572. With 1 text-fig.

The investigations which Toepfer has carried out, in regard to the transmission of relapsing fever by the louse, are dealt with in this paper, and the main results at which he arrived may be briefly summarised thus—

1. The louse, after being fed on the blood of an infected patient, contains spirochaetes in its gut. These spirochaetes are capable of multiplying enormously in this position.
2. The spirochaetes retain, in the gut of the louse, their form, motility, virulence and staining properties.
3. Special developmental forms of the spirochaete are not found in the louse.
4. The transmission of the spirochaetes from the louse to man does not appear to result from its "bite."
5. The infection of man is assumed to be brought about by the crushing of the louse on the skin or mucous surface and the subsequent entry of the liberated spirochaetes into the human host is believed to take place through a scratch or other abraded surface.*

R. P. C.

Korbsch (R.). **Ueber eine neue dem Rückfallfieber ähnliche Kriegskrankheit.** [A New War Disease resembling Relapsing Fever.]—*Deut. Med. Woch.* 1916. Mar. 23. Vol. 42. No. 12. pp. 343–345. With 4 charts.

An account of two epidemics of relapsing fever which occurred in the same regiments during two periods of the year 1915.

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* Nicolle, Blaizot and Conseil demonstrated this in 1912, in Tunis [see this *Bulletin*, Vol. 1, p. 32]. It is not stated where Toepfer's work was done—Ed.

The fever was characterised by a duration of three days followed by a two days interval. The temperature was seldom higher than 39°·5 C. and the pulse was invariably relatively slow. During the interfebrile periods the temperature was usually sub-normal. Both liver and spleen were frequently found to be enlarged and tender on palpation.

Diarrhoea was a characteristic feature in most of the cases.

The blood in addition to showing the presence of spirochaetes (7-10μ in length) displayed a slight leucocytosis. The leucocytosis was mainly due to a relative increase in the lymphocytes. Four temperature and pulse charts together with an account of a typical case are incorporated in the article.

R. P. C.

Macfie (J. W. Scott). **Urethral Spirochaetosis.**—*Parasitology.* 1917. Feb. Vol. 9. No. 2. pp. 274–292. With 4 text figs.

This paper gives an account of an acute urethritis, occurring in a native of the Gold Coast, due to a spirochaete infection of the urethra. The discharge was profuse, sanious, thick and foul, and persisted for six days. The temperature was slightly raised and pains were complained of in several of the joints.

Two intramuscular injections of perchloride of mercury were given during the period of the discharge, each dose containing one-third gr. of the drug.

Spirochaetes were found in large quantities in the pus examined and 300 organisms which were measured showed considerable variations in size. The average length measurement is given as 11μ, but forms as small as 5μ and as large as 20μ are recorded.

Some of the spirochaetes showed a membrane or crest. The cytoplasm is stated to be homogeneous and to contain chromatin granules and rodlets at frequent intervals along the body.

The number of curves or waves varied according to the length of the organism and a spirochaete of "about 11μ had, as a rule, four or five waves."

Macfie is of opinion that other factors (e.g., mode and rate of fixation) also play a part in determining the number of curves which the spirochaete possesses. Epithelial cells found in the purulent discharge were seen, in some cases, to be crowded with spirochaetes. In some of these cells, coccoid granules were also present, and these the author regards as the first stage in the life history of the organism. Macfie is of opinion that the whole life-cycle of the parasite is passed in the urethra and regards its developmental stages as occurring in the epithelial cells with which the urethra is lined.

He compares the development of the urethral spirochaete to that of *S. gallinarum* and other spirochaetes in the invertebrate host.

The name *Spirochaeta urethrae* is proposed for the parasite.

R. P. C.

Macfie (J. W. Scott). **The Prevalence of** *Spirochaeta eurygyrata* **in Europeans and Natives in the Gold Coast.**—*Lancet.* 1917. Mar. 3. pp. 336–340. With 1 text fig. & 1 chart.

As the result of a large number of examinations [number not stated] which the author has made of the faeces from Europeans, natives and

Syrians on the Gold Coast, he is of opinion that *S. eurygyrata* is practically a constant intestinal parasite of the residents there. He gives the last 20 cases of his series, which includes 5 Europeans, 14 natives and 1 Syrian, as typical of the rest. All the 20 examinations were positive and several of the cases showed the association of the spirochaete with flagellate and other intestinal parasites.

Extending his investigations to the faeces from sheep, cattle, goats, dogs, cats and rats, the author found that a " similar, if not identical, organism " was equally constant as a parasite.

The presence of these spirochaetes in the intestinal contents of a monkey, which died of amoebic dysentery, has previously been recorded on the Gold Coast by the author.

Macfie does not regard the organism as pathogenic, but, in certain circumstances, he finds it " difficult to believe that they can be entirely benign."

R. P. C.

SPIROCHAETOSIS ICTEROHAEMORRHAGICA.

STOKES (A.), RYLE (J. A.) & TYTLER (W. H.). **Weil's Disease (Spirochaetosis Ictero-Haemorrhagica) in the British Army in Flanders.**—*Lancet.* 1917. Jan. 27. pp. 142–153. With 13 charts & 9 figs.

This is an account of spirochaetosis ictero-haemorrhagica as met with amongst the troops in Flanders, and the writers consider that there can be no doubt that the disease is identical with that described by INADA and his collaborators in Japan [see this *Bulletin*, Vol. 8, p. 51.] The virulence, however, of the European type of the disease appears to be much lower than in the type described by the Japanese workers, and the present writers state that the prognosis is favourable and the death-rate low—" less than six per cent."

With one exception, all the cases met with were from the non-commissioned ranks—" and practically always amongst the 'trench troops.' " Wet, badly-drained trenches appear to be an important factor, either predisposing, or possibly as a medium through which the causative agent may reach and perforate the skin of man. It is suggestive that the writers were unable to trace one case as having been infected whilst in rest billets. They cite the case of one regiment in which a number of cases had occurred whilst in the line; during their stay in rest billets no fresh cases were noted; upon their return to the trenches cases were again produced.

Experiments carried out with the view of determining whether lice were the transmitting agents of the disease yielded only negative results, and the writers state that " from every point of view we think it is improbable that lice are the intermediate hosts, if there be an intermediate host in the cycle of infection."

Similar experimental work with mosquitoes was also negative, and the localisation of the infective foci to certain stretches of trenches " is also in opposition to the hypothesis of transmission by the mosquito."

With reference to the appearance of jaundice in man, the writers have been struck by the occurrence of cases, presenting the clinical picture of the disease, in which this symptom was absent. Guinea-pig inoculations from these non-icteric cases produced the characteristic disease in these animals; and smears from, or sections of, their tissues invariably showed the presence of spirochaetes. The absence of jaundice was estimated to be a feature in 40 per cent. of the human cases.

The writers have been able to confirm the observations of INADA and his collaborators both as to the reappearance of the spirochaetes in the urine after the tenth day of the disease and as to the formation of protective substances in the blood serum.

A footnote at the end of the paper states that they have also confirmed the presence of *S. icterohemorragiae* in the kidneys of the field rat.

Attempts to cultivate *Sp. icterohemorragiae*, as recorded by ITO and MATSUZAKI [see this *Bulletin*, Vol. 8, pp. 53–4] have so far been unsuccessful.

This paper gives an excellent account of the pathological changes which occur in the disease both in man and the guinea-pig, and full details as to the technique employed in the experimental work are given.

R. P. C.

MORESCHI (C.). **Appunti epidemiologici sulla spirochetosi itterogena.** [Epidemiological Notes on Icterogenic Spirochaetosis.]—*Policlinico.* Sez. Prat. 1917. Feb. 25. Vol. 24. No. 9. pp. 265–267.

MICHELI (F.). **Osservazioni e ricerche sull' ittero epidemico castrense.** [Observations and Researches on the Epidemic Icterus of Armies.] —*Ibid.* pp. 268–271.

The number under review of *Il Policlinico* is given up to the discussion of ictero-haemorrhagic spirochaetosis by a number of writers. There has been a considerable amount of this disease on both the Trentino and the Isonzo fronts during the present war. Professor Moreschi gives particulars of 361 cases noted in three different hospitals on the Isonzo line between June and November of 1916 in which the mortality was very low, being only 0·55 per cent. Out of 100 cases directly observed only 48 showed any degree of fever, which had an average duration of six days. The clinical symptoms varied in several other particulars from the description given by INADA and ITO. The author, in conjunction with Professor CARPI, has already described the successful isolation of the spirochaete from these cases by the inoculation of blood into guinea-pigs.

Professor Micheli's cases came from the Trentino district of operations, and showed an equally benign character. Experiments initiated with a view to ascertaining the anti-spirochaetal power of the serum of patients are briefly described as not encouraging, and are to be recorded at greater length in a future memoir. In 33 per cent. of one series of experiments the serum of convalescents was found capable of postponing for several days the death of an inoculated guinea-pig, and in another series, in the same percentage, of protecting a guinea-pig against at least a four-fold lethal dose of virus.

J. B. Nias.

SAMPIETRO (Gaetano). **La spirochetosi ittero-emorragica.**—*Ann. d'Igiene.* 1917. Jan. 31. Vol. 27. No. 1. pp. 23–38.

A systematic review of the present state of our knowledge of the form of infective icterus known as Weil's disease. The writer however points out that the disease as met with on the Italian front, and described by Italian writers, differs from WEIL's classical description in several particulars, such as relative benignity, absence of fever, and of albuminuria. In cases recognised as spirochaetal, in addition, there is no splenomegaly, while on the other hand there is a general enlargement of the lymphatic glands which is not mentioned by WEIL.

J. B. N.

MARTIN (Louis) & PETTIT (Auguste). **Présence de *Sp. icterohemorragiae* chez le Surmulot de la zone des armées.**—*C. R. Soc. Biol.* 1917. Jan. 6. Vol. 80. No. 1. pp. 10–11.

The discovery by the Japanese observers that the field rat is able to function as the reservoir host for *S. icterohemorragiae* is confirmed by Martin and Pettit. Their work has been carried out on brown rats obtained from the area in which fighting is now going on in France. An emulsion of the liver, spleen and suprarenal body of one of these rats was injected into a guinea-pig, producing all the symptoms of spirochaetosis ictero-haemorrhagica and proving fatal thirteen days after injection. The post-mortem examination of this animal showed the lesions characteristic of the disease and subsequent investigation revealed a large infection of spirochaetes in the liver. The rat from whose organs the lethal emulsion was made, was apparently normal during life, but when killed marked hyperplasia of the spleen was noted.

R. P. C.

MARTIN (Louis) & PETTIT (Auguste). **Evolution de la spirochétose ictérohémorragique expérimentale chez le cobaye.**—*C. R. Soc. Biol.* 1917. Jan. 20. Vol. 80. No. 2. pp. 65–66.

In recording the results of a series of experiments in which guinea-pigs were injected with blood or urine taken from cases suffering from spirochaetosis ictero-haemorrhagica, the authors point out that prolonged observation may be needed before a definite conclusion is arrived at. The incubation period of this disease in guinea-pigs may vary within wide limits, and death may not occur until as late as thirty days after inoculation.

R. P. C.

COSTA (S.) & TROISIER (J.). **Spirochétose ictero-hémorragique sans ictère, hémorragie ni rechute.**—*Bull. et Mém. Soc. Méd. des Hôpit. de Paris.* 1916. Nov. 23. 3 ser. Vol. 32. Nos. 31–32. pp. 1806-1810. With 1 chart.

Attention is called in this article to cases of spirochaetosis ictero-haemorrhagica in which the essential characteristics of the clinical picture are absent, and the course of the disease is so mild as to endanger the making of a correct diagnosis. Such a case is quoted in which a correct diagnosis was only arrived at after inoculation into guinea-pigs had given a positive result. In this case a slight and transient jaundice of the conjunctiva was present at the commencement of the attack, haemorrhages did not occur and no relapse ensued.

The writers consider that, as far as the patient is concerned, the failure to realise the true nature of the infection is relatively unimportant, but, from the epidemiologist's standpoint, these cases are of paramount importance.

R. P. C.

COSTA (S.) & TROISIER (J.). i. **Réactions méningées dans la spirochétose ictéro-hémorragique. Virulence du liquide céphalo-rachidien.**—*Bull. et Mém. Soc. Méd. des Hôpit. de Paris.* 1916. Nov. 23. 3 ser. Vol. 32. Nos. 31–32. pp. 1802–1806. With 1 chart.

ii. **Réactions cytologiques et chimiques du liquide céphalo-rachidien dans la spirochétose ictéro-hémorragique.**—*C. R. Soc. Biol.* 1917. Jan. 6. Vol. 80. No. 1. pp. 29–30.

The authors of these two papers state that meningitis is a nearly constant feature in cases of spirochaetosis ictero-haemorrhagica, and that they found it present in ninety per cent. of the cases which they examined. The condition is manifested clinically by stiffness of the neck and the presence of Kernig's sign.

Lumbar puncture shows the cerebro-spinal fluid to be under considerable pressure. This fluid is described as being limpid and more or less bile-tinged and, occasionally, as displaying fibrinous flocculi in suspension.

Cytological examination shows the presence of a marked leucocytosis, in which polymorphonuclear leucocytes represent 70–90 per cent. of the total white count. If, however, the examination be made towards the end of a case which is nearing convalescence, the tendency is towards an absolute lymphocytosis.

Chemical examination of the fluid demonstrates the presence of albumin and urea in excess, which may be considerable, and a deficiency in total chlorides. Sugar, when present, is usually found in small amount.

With a view to determining whether spirochaetes were present in the cerebro-spinal fluid, the authors carried out animal inoculations. The results were positive, and it was the opinion of the authors that this fluid is even more toxic for guinea-pigs than is the blood. The first of the above papers gives in detail the results of the chemical examination of the cerebro-spinal fluid from several cases of this disease and should be referred to by those interested in this work.

R. P. C.

GARNIER (Marcel) & REILLY (J.). **La recherche du spirochète ictérigène dans l'urine de l'homme et du cobaye.**—*C. R. Soc. Biol* 1917. Jan. 6. Vol. 80. No. 1. pp. 38–41. With 5 figs.

Garnier and Reilly recommend the centrifuging of the urine and the employment of the Chinese ink method in the search for spirochaetes in spirochaetosis ictero-haemorrhagica.

They state that this method has been very successful in their hands and that it is especially valuable in light infections.

R. P. C.

Krumbein (R.) & Frieling (B.). Zur Weilschen Krankheit.—*Deut. Med. Woch.* 1916. May 11. Vol. 42. No. 19. pp. 564–566.

An account of two cases of Weil's disease in man associated, in each case, with a similar disease in dogs with which they had been in contact. The writers draw the following conclusions from their notes and observations:—

1. That dogs suffer from a disease similar to Weil's disease in man; and that the infection of man may result from contact with such infected animals.
2. That indirect infection, through the medium of the dog-flea or gnats, is probable.
3. That the incubation period of the disease in man is a long one—three weeks.

Their treatment of the cases was "purely symptomatic" and consisted mainly of copious administrations of normal saline solution, either intravenously or subcutaneously.

A footnote to the article records a further case in which the patient was found to be heavily infested with crab lice. The authors suggest that these vermin may possibly play a part in the transmission of the disease.

R. P. C.

Costa (S.) & Troisier (J.). Sur la Spirochétose ictéro-hémorragique.—*C. R. Soc. Biol.* 1916. Dec. 2. Vol. 79. No. 19. pp. 1038–1042.

The authors have performed a number of experiments on guinea-pigs with the cerebro-spinal fluid of patients suffering from different forms of ictero-haemorrhagic spirochaetosis. Two guinea-pigs were inoculated from each of the four patients studied. Of these patients, two presented clinical features of the classical form at the time when the animals were inoculated; the third showed meningeal symptoms, while in the fourth case, the cerebro-spinal fluid was taken at the time of a relapse. In each case, 7 cc. to 10 cc. of the cerebro-spinal fluid was used for inoculation. In the first three cases, where the fluid was taken at the commencement of the illness, the guinea-pigs showed typical symptoms of infectious jaundice, and five out of the six contracted the malady, the sixth animal dying of shock. The cerebro-spinal fluid was thus shown to be virulent, even more so than the blood. In the fourth case, where the inoculation material was taken at a relapse, the incubation period was lengthy, but the animal became infected, and afterwards the inoculation of its urine to another guinea-pig proved fatal to the latter, which died after a typical illness. Two other cases in which material from relapses was used were negative. The cerebro-spinal fluid, then, was found to be infective at the period of relapse, and the existence of meningitis in infectious jaundice is demonstrated.

The syphilis fixation reaction in ictero-haemorrhagic spirochaetosis was also studied, tests being made by the rapid method of Hecht-Bauer and by the classic method of Bordet-Gengou. Five patients were so tested, none of whom had had syphilis. In two tests made with serum at convalescence positive results were obtained; negative results accrued in two cases tested after cure, while one test after cure gave a feeble positive result; one case was nullified by the absence of complement. These results were obtained by the rapid method. There were five positive and two negative results by the classic method. The syphilis fixation reaction seemed fairly frequent in cases of infectious jaundice.

The passage of the virus of infectious jaundice through the placenta of guinea-pigs was established. A pregnant female was inoculated with blood and urine from an infected dead guinea-pig. It died, and the amniotic fluid around a foetus was inoculated to another animal. The second animal died and intense jaundice was present at autopsy, while numerous spirochaetes were found in the liver.

In a discussion, PETTIT stated that he and MARTIN had produced a curative serum in a horse, which was effective for guinea-pigs, which serum he thought could be used in treating men.

A. P.

COSTA (S.) & TROISIER (J.). **Mort du lapin et survie du cobaye dans la spirochétose ictérohémorragique expérimentale.**—*C. R. Soc. Biol.* 1917. Jan. 6. Vol. 80. No. 1. pp. 27–28.

The appearance of jaundice in guinea-pigs, inoculated with material from patients suspected to be suffering from spirochaetosis icterohaemorrhagica, is held by the authors to be of sufficient value to justify the diagnosis being made.

They find that animals inoculated with the disease do not invariably succumb and that the recovery of the animal does not necessarily preclude the presence of the infection in the patient.

R. P. C.

GARNIER (Marcel) & REILLY (J.). **La recherche des substances immunisantes chez les convalescents de spirochétose ictérigène.**—*C. R. Soc. Biol.* 1917. Jan. 20. Vol. 80. No. 2. pp. 101–103.

The blood serum of patients convalescing from severe attacks of spirochaetosis ictero-haemorrhagica is found by Garnier and Reilly to be richer in immune bodies than is the serum from those patients who have passed through a milder form of the disease.

By their experimental work on guinea-pigs, they were able to demonstrate that the protective value of the former serum, against the virus of the disease, was high, whilst the later cases yielded a serum which had little, or no, protective value.

In consequence of this low protective value, the writers consider that this test alone would lead to confusion with other forms of jaundice, and they suggest that diagnosis should not be based on it but that examination for the specific organism in the urine should in all cases be made.

R. P. C.

GARNIER (Marcel) & REILLY (J.). **Action de la bile sur la virulence de *Spirochaeta icterohemorragiae*.**—*C. R. Soc. Biol.* 1917. Jan. 6. Vol. 80. No. 1. pp. 41–42.

These observers find that the addition of ox-bile to an emulsion of the liver of a guinea-pig, which had succumbed to *S. icterohemorragiae* infection, renders the emulsion innocuous when injected into a healthy animal. The amount of ox-bile added was 1 cc.

A similar result was obtained by the addition of 1 cc. of a 1 in 1,100 solution of either taurocholate or glycocholate of soda to a virulent emulsion. In this connection, they point out that, in the course of the disease in man, as the jaundice becomes gradually more marked the temperature progressively falls. This phenomenon they attribute to the anti-spirochaete action of the bile salts.

Immunity against the spirochaetes is not, however, acquired until a later period, and is due to the formation of definite immune bodies in the serum.

R. P. C.

MARTIN (Louis), PETTIT (Auguste) & VAUDREMER (Albert). **Coloration du Spirochète de l'ictère hémorragique par les méthodes de Löffler et de van Ermenghen. Présence de cils.**—*C. R. Soc. Biol.* 1916. Dec. 2. Vol. 79. No. 19. pp. 1053–1055. With 1 plate.

Examination of cultures of the spirochaete of infectious jaundice by means of the ultra-microscope being somewhat difficult on account of pseudo-spirilla in the blood, the authors have devised a method of differential colouration, using Löffler's stain for cilia and that of van Ermenghen. The autopsy of an infected guinea-pig must be made within six hours of death. The liver is ground up and diluted with salt solution. It is filtered and the filtrate centrifuged for ten minutes. Decant and add more saline. Centrifuge anew for five minutes. If the liquid is still cloudy, renew the operation. Make thin smears, dry, and stain with Löffler or van Ermenghen's solutions. In using the latter stain, use dilute alkaline aniline gentian violet instead of Ziehl's stain.

The spirochaete was found to measure about 9μ long and 1·5μ broad. The technique is responsible for the relatively great width. The body shows alternate light and dark areas, but is somewhat straightened after this procedure. The extremities of the spirochaete are stated to be furnished with cilia (or flagella of English authors). One of the cilia is stated to be nearly half the length of the body, the other is shorter and more rigid.

[It is obvious from the technique that maceration must occur, and this probably accounts for the cilia or flagella at the ends of the body. The micro-photographs, stated to show these structures, are rather indistinct.]

A. PORTER.

MISCELLANEOUS.

Macdonald (Angus). **Notes on Blood-Sucking Flies in Grenada.**—*Bull. Entom. Res.* 1917. Jan. Vol. 7. Pt. 3. pp. 259–264. With 2 plates.

Grenada is a mountainous volcanic island, about half the size of Middlesex; it has an equable damp climate with an average temperature of 80° F.; its chief cultivation is cacao and fruit trees. The only Anopheline found is *A. argyrotarsis* R. D., a recognised malaria carrier in the New World.

"Its permanent habitat in Grenada lies in the shallow moist flats in the neighbourhood of lagoons and estuarine swamps around the coast of the whole Island. Individually these spots are of no great dimensions; many are remote from human habitations, and effort properly directed should be able to abolish the breeding places at little cost.

"The temporary breeding places are unfortunately scattered throughout the Island in intimate contact with the residences of the human population. Chiefly in the wayside gutters along highways and byways, and in hoof-marks, pigwallows, trenches, and flats in grass land and elsewhere are these temporary breeding places to be found."

It loves pools on which the sun shines most of the day and an illustration is given of an exposed river bed with large boulders where larvae were found to swarm after flooding.

Stegomyia fasciata is the common domestic mosquito of the towns and villages but is not common in the country districts. Only twice has the author found it about native dwellings in the country and never in empty cacao pods.

Culex fatigans is found in wayside pools and ditches, especially if foul, and in cess pits, or their equivalent, flooded with water. "Filariasis in an acute form is not known at present in Grenada."

The rest of the paper deals in an interesting manner with mosquitoes which are not known to convey disease—*Limatus durhami* Theo., *Haemagogus splendens* Will., *Wyeomyia grenadensis* Edw. (a new species), *Megarrhinus haitiensis* D. and K., *Ochlerotatus niger* Giles, and others. *L. durhami* is "perhaps the most ubiquitous mosquito in Grenada"; it breeds usually in old cacao pods. *Janthinosoma neoapicalis* Theo. is found in shallow waters together with *A. argyrotarsis*. A Ceratopogon, the "sand fly" of Grenada, is practically ubiquitous and in moist places swarms. Stomoxys is about as common as in England.

The other photographs show a silk cotton tree with numerous epiphytic "wild pines" in which larvae of five different species of mosquito were found, and an avocado pear and mango with holes, in which species of Wyeomyia and Megarrhinus respectively were found breeding.

A. G. B.

i. **Macfie** (J. W. Scott). **Notes on the Insects collected at Accra during the Year.**—*Report of the Accra Laboratory.* 1915. pp. 76–79. With 1 plate. London: J. & A. Churchill.

ii. **Corson** (J. F.). **Entomological and Other Specimens collected in the Northern Territories, chiefly in the Districts of Wa and Lorha.**—*Ibid.* pp. 30–35.

i. Twenty species of mosquitoes were collected, thirteen in the author's bungalow; by far the commonest was *Mansonioides africanus.*

Nine had not previously been recorded for Accra, bringing the total of recognised species to forty-one; a list of these is given. Those taken in the house must have come from a distance because there was no place in the immediate vicinity in which they could have bred. Photos show where *Anopheles costalis* was found breeding. A complete list of the insects collected is given, as determined at the Imperial Bureau of Entomology.

ii. A list of the insects and helminths is given, the identifications being furnished by Mr. H. F. CARTER and Professor J. W. STEPHENS. The first list, in column, occupies two pages and includes 17 Culicidae and 13 Tabanidae. Previous collections in these districts were made by Dr. J. J. SIMPSON.

It is noted that nematodes of the genus *Physaloptera* are almost constantly found in the stomach of various species of rat, and that these rats are eaten by the natives. There are also notes on trypanosomes in equines and bovines, haemogregarines in frogs, and a Protozoon (?) observed in the blood of a snake.

A. G. B.

ROUBAUD (E.). **Les Porcins et la conservation des Ectoparasites humains, dans les régions chaudes.**—*Bull. Soc. Path. Exot.* 1916. Dec. Vol. 9. No. 10. pp. 768–771.

In this interesting paper the author brings together observations, his own and those of others, showing that certain bare-skinned animals in Africa which live in burrows—warthogs and ant-bears—may serve blood-sucking larvae, such as the Congo floor maggot, chigoes, ticks, etc. as substitutes for man. Their skin, like that of man, is almost hairless. Thus the Cheromyia associated with wart-hogs is closely related to the Auchmeromyia associated with man, and the larvae can be reared on either host. Cheromyia is found in native huts as well as in the warthog burrows.

The observations of others are these:—LLOYD in Rhodesia found *Ornithodorus moubata* in warthog burrows far from human habitation [this *Bulletin*, Vol. 8, p. 51]; WELLMAN in pigstyes in Angola. Van SACEGHEM has recently found this tick, unknown to natives of the locality, in pigstyes at Zambi on the lower Congo. Chigoes are well known to be common to both man and the pig; in Brazil the chigoe is known as "bicho de porco" [see this *Bulletin*, Vol. 9, p. 210]. On the island of Principe the Portuguese Mission showed that the wild pigs formed the chief support of *Glossina palpalis*; the extermination of the pigs, with other measures, brought about the extermination of the fly. MOISER in Nigeria has pointed to the abundance of warthog in the haunts of *G. tachinoides* [*loc. cit.* Vol. 2, pp. 589–90]. NOELLER finds that the pig louse can remain alive for a long time on man, and the clothes louse for seven days on the pig.

It is concluded that as regards the nutrition of ecto-parasites the pig is the nearest animal to man. A list is given of the endoparasites transmissible to man which are harboured by the pig—several species of helminths and *Balantidium coli*; blood parasites, such as certain trypanosomes, should be added. More observations are wanted on the subject of this paper.

[The following quotations from LLOYD are interesting in this connection:—"It is [in Rhodesia] a very common experience to see tsetses fly out of a burrow in the ground." "In ten instances they (pupae) were found in the burrows of various animals. . . . These are usually the holes of bushpig or warthog." (*Bulletin of Entomological Research*, 1914. Vol. 5, pp. 55 and 57.)]

MACFIE (J. W. Scott). **Morphological Changes observed during the Development of the Larva of** *Stegomyia fasciata*.—*Bull. Entomol. Res.* 1917. Jan. Vol. 7. Pt. 3. pp. 297–307. With 7 text figs.

The larva of *S. fasciata* passes through four distinct phases after it emerges from the egg and before it pupates. These have been studied in the present paper, certain morphological details of each phase being figured. The characters of the four phases are then summarised. The author thinks that for purposes of classification it would be best to deal only with larvae in the last phase, which are always easy to recognize.

A. G. B.

PUBLIC HEALTH REPORTS. 1916. Nov. 17. Vol. 31. No. 46. p. 3159.—**Mosquitoes. An Unusual Breeding Place.**

At La Guaira, Venezuela, in the American consulate, mosquitoes were troublesome though no breeding place could be found. Larvae were eventually discovered in the ice chamber of a water cooler; they were unfortunately thrown away before determination. Thereafter the cooler was attended to and the mosquitoes disappeared.

A. G. B.

WERNER (H). **Beobachtungen über Anophelenvorkommen in der Nähe menschlicher Fäkalien.** [Occurrence of Anopheles near Human Excreta.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1916. Oct. Vol. 20. No. 19. pp. 444–445.

The observation briefly recorded here was made in the spring and summer of 1916 in the swamps of White Russia. Anopheles were found to congregate in the latrines. The Culex, which were found in great quantity, did not. Often the Anopheles were not to be found elsewhere. It is suggested that they were attracted by the faecal smell. The species is not named.

A. G. B.

MACFIE (J. W. Scott). **The Limitations of Kerosene as a Larvicide, with Some Observations on the Cutaneous Respiration of Mosquito Larvae.**—*Bull. Entomol. Res.* 1917. Jan. Vol. 7. Pt. 3. pp. 277–295. With 1 text fig.

The author points out some of the limitations of oiling as a measure to banish mosquitoes from towns and stations; e.g., at Accra it is difficult to maintain an unbroken surface of oil owing to wind, which drives the oil to one side, and to the sun which causes rapid evaporation; moreover, the mosquitoes, commonly caught in houses do not correspond to the larvae found in the compounds [see this *Bulletin*, Vol. 9, p. 99], but are species of Mansonioides which have bred at a distance, perhaps a mile away. It is, too, impossible to oil the lagoons owing to their size and situation and here a species of Culex often found in Accra houses breeds freely; it can (in a laboratory experiment) live submerged for many days. He goes on to discuss the mode of action of kerosene as a larvicide. The suggested modes are, annulling the surface tension of the water, depriving the larvae of access to air, and a poisonous action. As a result of some experiments Macfie thinks that the third suggestion is the correct one.

The different periods of survival of the larvae in different experiments led him to study the oxygen requirements of submerged mosquito larvae. The larvae were confined singly in small tubes holding about 8 cc. of fluid, the surface being covered with a layer of melted paraffin one cm. deep. The factors determining survival were the species of mosquito: *S. fasciata* survived longer than two other species used; the age of the larvae: young larvae survive longer than fully-developed ones; the temperature: a lowering of the temperature prolongs and a raising of it shortens the period of survival of submerged *S. fasciata* larvae; the presence of organic matter in the medium: this materially shortens the period of survival, and the cause probably is the smaller quantity of dissolved oxygen; the presence of water weeds. These factors are so various that it is practically impossible to arrange a satisfactory series of experiments.

The part played by cutaneous respiration is next discussed, and the proportion of the dissolved oxygen available. The survival of larvae submerged in slowly running water was studied by means of an apparatus which is figured. Here larvae of *S. fasciata* lived in comfort up to the stage of pupation, often more than 20 days. It is concluded that, as stated by SEN, they respire the oxygen of the air dissolved in water. The practical bearing is that larvae may escape the action of any injurious substance on the surface. Finally, the results of oiling with crude kerosene as observed in laboratory experiments on various species of mosquitoes are given.

A. G. B.

MACFIE (J. W. Scott). **Chlorine as a Larvicide.**—*Report of the Accra Laboratory.* 1915. p. 71: London: J. & A. Churchill.

In view of the fact that minute traces of chlorine render even highly polluted water safe for drinking purposes Dr. Macfie thought it desirable to find out in what proportion the gas must be present to kill mosquito larvae. *Stegomyia fasciata* larvae, in tap water or their natural medium, were unaffected by chlorine in proportion of 1 in 500,000, 1 in 250,000, 1 in 50,000, and 1 in 25,000. In 1 in 10,000 all were dead within 24 hours. The conclusion is that chlorine has no special application as a larvicide. The water was chlorinated by Harper NELSON's method.

A. G. B.

SADI DE BUEN. **Los mosquitos del genera "Phlebotomus". Su interés medico.** [The Flies of the Genus Phlebotomus. Their Medical Importance.]—*Siglo Med.* 1916. Oct. 28. Vol. 63. No. 3281. pp. 695–696. With 1 text fig.

A short note, with an illustration of the insect, drawing the attention of Spanish practitioners to the importance of Phlebotomus as a propagator of three day or pappataci fever. DOERR, TAUSSIG and FRANZ have shown that the insect is not merely a mechanical transmitter of the virus, but that an incubation period of a week within the body of the insect is necessary. TOWNSEND has emitted the opinion that a species of Phlebotomus is the transmissor of verruga ; SERGENT and others, again, have suggested that the leishmaniasis of Oriental sore is transmitted by a Phlebotomus, the reservoir being the gecko (*Platydactylus mauritanicus*). Medical practitioners in Spain should therefore note that Oriental sore is common on the African coast of the Mediterranean, that flies of the genus Phlebotomus have been recognised in Granada, Malaga, and Palma de Mallorca in Spain and that the gecko, vulgarly termed " drago " in Catalonia and the Balearic Islands, is found practically all over Spain. Phlebotomus has also been taken by PITTALUGA in Spanish Guinea.

J. B. Nias.

SWELLENGREBEL (N. H.). **Quelques remarques sur la façon de combattre le pou des vêtements.**—*Arch. Néerland. des Sci. Exact. et Nat.* 1916. Vol. 3. Ser. 3 B. pp. 1-31. With 1 plate & 23 text figs.

A French version of a Dutch paper briefly reviewed in this *Bulletin*, Vol. 7, p. 193. As it contains several observations of interest it is deemed worthy of a further notice. Dr. Swellengrebel finds a want of precision in the majority of the works which treat of the destruction of lice, and notes especially that it is often assumed on quite insufficient evidence that the eggs have been destroyed. He finds fault also with the technique of some of the observers. His own experiments were made in the laboratory at Amsterdam.

Some of his remarks on the biology of the clothes louse are of interest. He notes that the larva when it emerges from the egg is invisible on the skin to the naked eye, but that it is then extremely active ; hence it may play an important part in the spread of the lice pest. The irritation caused by the louse bite was in his case very slight and disappeared in an hour. If however he squashed a biting louse there was redness, oedema, and itching, followed by superficial necrosis of the skin, so that the place was visible a fortnight later. When the bite is unexpected, one scratches involuntarily with the above named results. As illustrating the tenacity of life of the eggs he states that if a female dies containing fertilised eggs these may develop into the intra-ovular larval stage even when the body of the mother has been bleached for some days in peroxide of hydrogen solution, washed for hours in alcohol, and then immersed in glycerin.

He comments on the ease with which lice make their way through fissures and cracks, an important fact in the fashioning of garments for protection. In reference to the statement that in German hospitals the beds of typhus patients are surrounded by a gutter containing a pediculicide, in order to prevent the lice from travelling to other beds " as if they were ants," he says that he put lice at intervals varying between 50 cm. from, and quite close to, his arm, but in the latter case only did they approach the skin ; the others stayed where they were till they were found some hours after. On the other hand he was struck by the rapidity with which they attached themselves to a fragment of rag or wisp of wool and were carried off with it; he attributes to this the infection of so many doctors with typhus. This portion of the memoir is well illustrated.

He goes on to the destruction of the eggs in clothes and on the human body and of the adults on the skin. A rational attempt at destruction of lice must, he says, be aimed at the eggs as being the most resistant forms. In making experiments therefore one must have a certain criterion of death; such is a marked shrivelling of the eggs. A sure method of testing accuracy of results is to attempt to hatch out the treated eggs but at least ten days are necessary, even to the intra-ovular larval stage. The results of experiments are then detailed. They were conducted on a big scale, as would be done in practice in the field, the only departure from actual conditions being that instead of attachment of the eggs to clothes they were placed in glass tubes closed at each end with wool and laid between the clothes. Hence conditions were less favourable than the normal. The tabulated results show that ammonia, developed in an "Autan" apparatus or in Flügge's lamp, was effective, as were also formaldehyde in a Rubner apparatus, hot air at 70° and benzene vapour, but the trials with the last-named methods were less numerous. For the details the paper must be seen. For disinfection where no steam apparatus is available he recommends ammonia, benzene or sulphide of carbon, in a disinfecting chamber which is figured. The pros and cons of each substance are stated.

Substances used successfully for destruction of eggs on the skin, tested by plunging the eggs into them for varying periods, were 3 per cent. creolin, "lotio contra pediculos," and essence of anise with alcohol. He questions the sufficiency of a hot bath.

He experimented on the destruction of the adults on the skin by keeping them and the substance to be tested in separate glass tubes secured near one another in a sleeve worn on the arm next the skin, but it seems probable that the conditions were too rigorous for he found iodoform and naphthalin without effect [cf. PEACOCK; KINLOCH; this *Bulletin*, Vol. 8, p. 383]. He distinguishes between pediculifuges and pediculicides. Efficient pediculifuges were not found. Of pediculicides the essential oils are too volatile, the only exceptions being essence of anise. The results obtained with lausofan (Bayer & Co.) anisol and globol (p. dichlor-benzene) were promising. He doubts whether aromatic substances have much value. Pure acetic acid is excellent but harms the skin.

A. G. B.

BACOT (A.). **A Contribution to the Bionomics of** *Pediculus humanus* (*vestimenti*) **and** *Pediculus capitis.—Parasitology.* 1917. Feb. Vol. 9. No. 9. pp. 228–258. With 4 text-figs.

The summary of this paper, which contains 15 tables of experiments, is as follows:—

"*General comparative note on the two species.*

"*Pediculus humanus* (*vestimenti*) is a larger, more robust and less active insect than *P. capitis*—the ♀♀ having a relatively greater egg-carrying capacity than those of the head louse. The eggs are larger and the number laid (under the conditions of these experiments) is greater, while the habits associated with egg laying differ, although placing the ♀♀ of *humanus* under conditions applicable to *capitis* or *vice versa* may induce a considerable degree of uniformity. Cross pairings between the insects are easily brought about and the offspring are fertile *inter se.* Hybrid strains were maintained until the F. 3 generation and there seemed no reason, judging from breeding results, why such strains should not be continued indefinitely. Nevertheless the marked disparity in the sexes of the F. 1 generation of some of the crosses between *P. capitis* ♂ and *P. humanus* ♀ suggests that the parents are specifically distinct."* . . .

Habits.—The body louse exhibits some of the habits of a gregarious animal especially during the moulting phases, also a preference for returning to the same spot for oviposition, which leads to the clustering of its eggs. These habits are shown, though in a less marked degree, by *P. capitis*, and it is possible therefore that they are to some extent the outcome of confinement. . . .

"A ♂ of *P. humanus* fertilized 18 out of 21 ♀♀ placed with him in succession. Four attempts with *P. capitis* were less successful; one ♂ fertilized ten ♀♀ and very possibly might have equalled the *P. humanus* record but for a scarcity of virgin ♀♀ while the experiment was in progress. The longest period during which a ♀ of *P. humanus* retained the power to lay fertile eggs in the absence of a ♂ was 20 days, usually it would seem to be from 16 to 18 days. In the case of *P. capitis* the period was shorter; 12 days being the longest ascertained period, while it was more usually from seven to eleven days.

"The greatest number of eggs laid by any one ♀ of *P. humanus* was 295, an average of 6·4 per day—the daily average of a number of ♀♀ being 5·1. *P. capitis* ♀♀ showed a lower fecundity, the highest record being 141 with a daily average of 4—the general average being 3·7. These figures are probably exceeded under natural conditions. An experiment in differential feeding with *P. humanus* (Table VIII) shows clearly that fecundity is dependent on feeding. When extra feeding time over and above seven hours per day was given the average for four ♀♀ was eight per day. It is reasonable to suppose that the average for *P. capitis* would also be increased by unrestricted feeding.

"The fertility of the eggs laid was not affected by increased feeding. The greatest number of fertilized eggs laid by a ♀ *P. humanus* after the removal of the ♂ was 115 (♀ No. 9), with a ♀ showing a higher daily laying average this might well be exceeded. With *P. capitis* the parallel figure is 70 (♀ No. 9). The ♀♀ of both species, after arriving at maturity, started oviposition irrespective of their having paired or not, but eggs laid by virgin ♀♀ were invariably infertile.

"*Length of life.* The life of the ♂ *P. humanus* used in the experiment recorded in Table I was 32 days; the longest ♀ life was 46 days, with an average of 34. For *P. capitis* the figures were: ♂ life 30 days; ♀ life 38 days, with an average of 27 days. Whether or not the average lives of the insects would be extended by unrestricted feeding is an open question.

"The life of the hybrid insects was not noticeably shorter than that usual for *P. humanus*, and they seemed to thrive better than *P. capitis*.

"Tests made with *unfed P. humanus* showed that the longest lives were at a medium temperature of 16° to 18° C., many of the insects living from three to four days, while two lived five and one lived seven days. At 24·5° C. all died within five days. At 36·1° C. all died within three days.

"Newly-hatched larvae, unless fed, lived less than 24 hours at 36·1° C., and when kept in a box in the vest pocket they lived but little more than a day; none survived a second day.

"Adults kept in a box in the side pocket of a coat lived five days without food; this was in March." . . .

"*Cold.* Active specimens of *P. humanus* survived two days at a temperature of —2·3° C. to — 1·1° C., but none recovered after exposure to these conditions for a week.

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* Professor Nuttall, in the same number of *Parasitology* (p. 294), writes:—"The head louse and clothes or body louse . . . are identical in all parts of structure and can no longer be regarded as distinct."

"*Hatching of eggs.*—Table IX shows that under humid conditions at 31° C. 3 per cent. of the 1,300 eggs tested hatched on the seventh day; 56 per cent. on the eighth; 33 per cent. on the ninth; 8 per cent. on the 10th and ·2 per cent. later on the same day or on the 11th.

"A test of batches of eggs taken from a stock box, some of which must have been laid several days previously, showed that none hatched at 15·6°–18·4° C., while at 24·5° C. there was considerable egg mortality, and the hatching period was spread over a longer period than usual, though not to the extent mentioned by Warburton (1909); at 36·1° C. hatching was spread over five days and the mortality was not excessive.

"To give some idea of the possible rate of multiplication of *P. humanus* we may estimate the egg period as 12 days and a further 12 days to the maturity of the ♀♀. Allowing an average of eight eggs per day, spread over a fertility period of 40 days, we find that, during her life, a single ♀ may have 4,160 offspring."

The insects were kept in glass-bottomed entomological boxes lined with a loose slip of cloth. The open top was covered with chiffon, the lid being partly closed. The box was nested in one of a larger size. The boxes were inserted in holes punched in pieces of card, by means of which they were maintained in contact with the body during sleep, the insects feeding through the chiffon. By day the boxes were carried in the waistcoat pocket.

A. G. B.

BODKIN (G. E.) & CLEARE (L. D.). **Notes on Some Animal Parasites in British Guiana.**—*Bull. Entomol. Res.* 1916. Oct. Vol. 7. Pt. 2. pp. 179–190. With 1 map & 3 text figs.

The authors state that with very few exceptions all the species and observations recorded in this article are the outcome of their own work during the last two and a half years. Many species of parasitic worms have been found in domestic animals, where is "a highly interesting field of almost unlimited scope." A species of Ankylostoma "resembling *A. ceylanicum* Looss" occurs in most dogs. A species of Physaloptera is very common in the stomach of cats and in these animals a species of Dicrocoelium is very prevalent. *Echinorhynchus gigas* is a common inhabitant of the small intestine of pigs. Six species of tick are mentioned, one of which, *Amblyomma cajannense* F., is commonly met with as a parasite of man. The list of Tabanidae includes numerous species. Fleas, bugs, lice and numerous Mallophaga are listed, with remarks. With regard to the climate the authors say: "For those who lead regular lives and do not expose themselves to unnecessary risks the climate is decidedly a healthy one."

A. G. B.

DONALDSON (R.) & MCLEAN (R. C.). **Plant Hairs as Pseudo-Parasites.**—*Lancet.* 1916. Dec. 30. pp. 1100–1102. With 1 plate and 3 text figs.

The authors, one of whom is a bacteriologist, the other a botanist, describe a case of diarrhoea from Chili in which the discharges were examined and puzzling bodies, suggestive at first of male ankylostomes, except as to size, were found, which were identified as the grapnel hairs of the common runner bean. They consequently illustrate in this article a large number of plant hairs, remarking that these may form the starting point of appendicular concretions (SHATTOCK, 1916) and some may act as irritants to the alimentary canal.

Of the 26 sorts of plant hairs illustrated, with different magnifications, some are from fruits, others from herbs or cereals.

Three points to which they direct attention in the identification of a hair are :—(1) The number of cells of which it is composed ; (2) the thickness of the wall ; and (3) the characters of the base or point of attachment. Tropical plants which do not possess hairs on the edible parts are, pineapples, bananas, and maize. It is pointed out that only the novice would mistake plant hairs for parasites. [Reference may be made to this *Bulletin*, Vol. 2, p. 627, and Vol. 9, p. 49 , for instances of errors of the kind.]

A. G. B.

AUSTRALIAN INSTITUTE OF TROPICAL MEDICINE. **Half-Yearly Reports from 1st July to 31st December 1914, and from 1st January to 30th June 1915.** 22 pp. 1915; and **from 1st July to 31st December 1915.** 10 pp. 1916. [Director: A. BREINL]. Printed and Published for the Government of the Commonwealth of Australia by Albert J. Mullett, Government Printer for the State of Victoria.

(1) The Director was employed during this period with Dr. PRIESTLEY in the investigation of " Mossman fever " [this *Bulletin*, Vol. 6, p. 314]. It was shown that monkeys are susceptible and that the cause is probably either a protozoon or one of the ultra-microscopical group of organisms. Dr. W. J. YOUNG worked at the body temperature, as measured in the rectum, of white people in the tropics, reaching the conclusion that its limits are not materially different from those found in a cool climate [*loc. cit.*, Vol. 7, p. 338]. Dr. Wm. NICOLL examined 13 cases of worm infection, most of which were mixed. In five cases of ankylostomiasis the average number of worms collected was 81 Ancylostoma and 45 Necator. The local animals were systematically examined for parasitic worms ; the results have been set forth in published papers. Observations were made on the growth and development of larval hookworms under different conditions. When the eggs are reared under adverse conditions, e.g., in the presence of salt or putrefying matter, the embryonic development is considerably retarded. " The larvae grew most rapidly on a substratum of well-washed and diluted faeces and may reach their full development within four days." The incidence of worm infection among human beings in this region is stated to be relatively low as compared with that in other tropical countries. Dr. F. H. TAYLOR writes on the results of mosquito mapping.

(2) In this half year Dr. Breinl was engaged in the investigation of problems connected with beriberi. His experience has led him to regard beriberi as a " place-borne disease " and he sought to confirm McGARRISON's work, who found a bacillus of the *suipester* group in pigeons suffering from the beriberi-like disease produced by exclusive feeding on polished rice. The attempt was negative [this *Bulletin*, Vol. 8, p. 466]. An attempt was made to transmit dengue fever to monkeys by blood inoculation ; in six experiments the monkeys failed to react. Arneth counts were made on blood films from New Guinea natives [*loc. cit.*, Vol. 7, p. 336]. Forty-five patients were admitted

to hospital with dengue in this half-year. Dr. YOUNG pursued investigations into the constituents of the urine of white people living in the tropics and studied the mechanism of the action of organic arsenic compounds in the treatment of certain protozoan diseases. Dr. NICOLL continued his experimental work on worm nodule disease and on the larval development of the hookworm. Dr. PRIESTLEY accompanied the Ophthalmic Inspector of Schools for Queensland on a tour to investigate the eye diseases among children in the west. It was doubtful whether the trachoma of Queensland was real trachoma or a disease resembling it. In many cases the scrapings from the conjunctiva were found to contain "trachoma bodies." It was concluded that "true trachoma does exist and is very prevalent in Western Queensland, but that it is of relatively very mild type."

(3) In this half year Dr. Breinl spent about two months travelling through part of the Northern Territory with the Chief Health Officer, visiting the Melville and Bathurst Islands and the Daly and Alligator Rivers. Whereas in the older settled districts malaria is prevalent, no sign of it could be detected among the natives of the above-named rivers and 250 natives of the islands were examined with a negative result. This confirms Breinl's previous conception that malaria is not endemic among these natives. Other diseases seen were, yaws, gangosa, a disease resembling acne, tropical ulcer and ulcus interdigitale destruens [this *Bulletin*, Vol. 6, p. 132]. Syphilis and tuberculosis, probably introduced, had a wide distribution. On the whole the health of the wild natives was excellent. With Dr. PRIESTLEY the tartar emetic treatment of ulcerative granuloma was tested. Hitherto this disease, prevalent among the aboriginal population, had been considered incurable. The results obtained in the one case were very encouraging. In two months "about 52" cases of typhoid were admitted to the tropical ward—a relatively large number of children and women. All were found to be due to *B. typhosus*; none to paratyphoid. Details will be published. Dr. NICOLL studied the system of night-soil disposal. It appeared to be satisfactory "not only in disposing of the excreta but also in preventing the development and spread of hookworm larvae." Dr. PRIESTLEY investigated the mechanism of the agglutination reaction, with results which are set forth.

A. G. B.

NIGERIA. **Annual Report, 1915, Medical Research Institute.** [CONNAL (A.) & COGHILL (H. Sinclair).]—29 pp. 1916. London: Crown Agents for the Colonies. [Price 2*s*. 6*d*.].

In the introductory paragraph to this Report it is stated that special attention has been directed to ankylostomiasis, babesiasis, blood-sucking flies, dysentery, skin diseases and trypanosomiasis. A tabular statement shows that of a total of 1,088 natives examined by different medical officers in the Southern Provinces 52 per cent. harboured ankylostomes. The inmates and staff of the Yaba Lunatic Asylum (all natives) and the native staff of the Institute were examined with care—136 persons. "Negative results were not accepted until five smears from each of three separate stools chosen at weekly intervals had been searched." Ankylostome ova were found in 133 or nearly 98 per cent. Two or more stools had to be examined in only nine cases. Eighty-eight subjects were divided into four unequal batches and treated in various ways with thymol. " Twenty-two out of 85 were apparently cured, and the highest percentage of these occurred in the group which received twice daily [10 grain] doses of the drug over a long period [35 days."] From the comparative absence of symptoms it is inferred that the cases treated were carriers rather than sufferers from the infection.

Of blood-sucking insects caught and identified 320 were dissected; smears were made of the proboscis, cephalic muscles, thoracic muscles, and intestinal tract. The results do not lend themsleves to summary. An account is given of the blood and other findings in two lepers treated with salvarsan. Details are furnished of the cultivation of the parasites from a case of subtertian malaria. From a case resembling Pyosis mansoni a Gram-positive diplococcus was isolated; its cultural characters are set down.

A collection of blood and gland juice smears obtained by Dr. H. A. Foy from natives on the Benue River was examined. *T. gambiense* was found in 17 instances. Of dried smears from 168 cattle examined [type and provenance not stated] 29 per cent. showed trypanosomes, mostly resembling *T. vivax.*

A second section of the Report deals with Clinical Material. Four cultures from faeces and urine proved to be *B. typhosus* (two) and *B. paratyphosus* A (one).

Mosquito larvae were received for identification almost every day throughout the year. An account is given of the species, and the numbers of each, received in each month, of the way in which the larvae were associated, and of the receptacles wherein they were found; the data are set out in two tables. During the year *Stegomyia fasciata* formed 62·5 per cent. and *Anopheles costalis* 7·6. *Culiciomyia nebulosa* was intermediate; from data given earlier in this report it is considered that this mosquito " prefers avian to mammalian blood." The most frequent association of larval species was between *C. nebulosa* and *S. fasciata*. *Culex fatigans* was determined only five times.

[The last Report from this Institute was summarised in this *Bulletin*, Vol. 8, p. 214.]

A. G. B.

ACCRA. **Report of the Accra Laboratory for the Year 1915.** [J. W. Scott Macfie, Pathologist].—101 pp. With 6 plates. London: J. & A. Churchill.

Of this Report twenty pages are occupied by an account of the routine examinations made during the year and the remainder by 16 papers on special investigations by medical officers in the Gold Coast—an innovation to which Dr. Scott Macfie refers in his Introduction. During the second half of the year Dr. S. L. Brohier was in charge of the laboratory. The account of the routine examinations does not contain much that is of general interest. It is noted that " several of the [blood] films from natives showed parasites of the type for which Professor Stephens has proposed the name *P. tenue.* In the same specimens other parasites resembling those of malignant tertian malaria, or actually crescents, were found; and for this reason these cases have been included under the heading *P. falciparum.*"

In respect of differential leucocyte counts "it cannot be too strongly insisted upon that in the tropics the percentages given as the standard for the healthy European in Europe do not hold good. In particular the low percentage of polymorphonuclear leucocytes in both Europeans and natives in the tropics must be remembered in interpreting the significance of a differential leucocyte count." From 60 to 75 in Europe the percentage of polynuclears is between 50 and 60 in the Philippines. In West Africa it is 58·5 in Europeans (Connal, 181 examinations) and 44·86 among natives (Connal, 722 adults). [cf. Breinl and Priestley, this *Bulletin*, Vol. 7, p. 336].

Of 17 specimens of faeces from Europeans and 15 from natives *E. histolytica* was found in seven of the first and one of the second. Attention is drawn to the heavy trypanosome infection of hump-backed cattle slaughtered at Accra; of 48 examined 45 were thus infected; as is pointed out, their introduction cannot but be a menace to the lives of domestic animals bred in the immediate neighbourhood. A number of tables are furnished in this part of the Report. A positive Widal reaction was obtained with the serum of four European cases [no details].

The papers on special investigations will be dealt with elsewhere in this *Bulletin.* The plates illustrate various protozoa (stained and unstained), two mules suffering from trypanosomiasis, breeding places of mosquitoes, a fungus found infecting *G. palpalis* and a case of sarcoma of the orbit.

A. G. B.

Weston (T. A.). **Report on 170 Cases operated upon under Spinal Anaesthesia.**—*Brit. Med. Jl.* 1916. Dec. 9. pp. 794–795.

Captain Weston, R.A.M.C. was surgical specialist at Lucknow. His cases were as follows:—

Hernia	28	Varicose veins	11
Appendicectomy	23	Hydrocele	8
Varicocele	20	Aneurysm of popliteal artery	1
Haemorrhoids	19	Amputation of thigh	1
Circumcision	14	Wheelhouse	1
Removal of loose cartilage	11	Salpingitis	1

The majority were British soldiers. Barker's stovaine-glucose solution was used. The anaesthesia, which usually reached the nipple line, was complete on an average in 3¼ minutes and lasted 50–60 minutes. There were no serious after effects. Slight dyspnoea disappears if the head and shoulders are raised somewhat. To prevent headache, move the patient with extreme care. The advantages are, perfect relaxation, portability of apparatus, and diminishment of shock and respiratory disturbance. Patients who have had spinal and general anaesthesia prefer spinal. The disadvantages disappear with experience, except the main one—that operation can be performed only on parts of the body below the nipple line. [For recent papers on this subject see this *Bulletin*, Vol. 6, pp. 421–2.]

A. G. B.

HUFF (E. P.). **Strychnin-Stovain Spinal Anaesthesia, A Visit to the Clinic of Dr. Thoma Ionnescu, Bucharest, Roumania.**—*U. S. Nav. Med. Bull.* 1917. Jan. Vol. 11. No. 1. pp. 34–44.

Strychnine-stovaine is the only anaesthetic employed in the chief hospital at Bucharest and not a single death has occurred as a result of its administration in a series of over 10,000 operations performed by Dr. IONNESCU and his assistants. An account is given of the technique and a translation of Ionnescu's latest monograph of the method, as applied to the special needs of military surgery in the field. This is most detailed and cannot be summarised. The injections are either mediocervical, upper dorsal, dorsolumbar, or lower lumbar according to the point where the needle enters, and the effect required. [This method should be of special value to the single-handed practitioner in the tropics.]

A. G. B.

REINHARD (P.). **Die radiologische Untersuchung tropischer Lebererkrankungen.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1916. Oct. Vol. 20. No. 20. pp. 455–466. With 3 plates.

This paper is one for the expert. The 12 photographs comprised in the three plates illustrate the normal liver, alterations in the position of the liver compatible with health, the "classical form" of liver abscess and the same when the stomach is blown up by means of an effervescing powder, hepatic carcinoma, etc. Changes in the position or size of the liver due to other diseases contracted in the tropics are also discussed. Thirty-three references are given, nearly all German with the exception of papers by BÉCLÈRE.

A. G. B.

DE PAULA SANTOS (A.). **Cholesterinemia no sôro dos impaludados e ancylostomoticos. (Nota prévia).** [Cholesterin in the Blood-Serum of Patients suffering from Malaria or Ankylostomiasis. Preliminary Note.]—*Ann. Paulist. Med. e Cirurg.* 1916. Sept. Vol. 7. Year 4. No. 3. pp. 58–61.

The author, in collaboration with Dr. R. M. da SILVA, communicates a method of estimating the amount of cholesterin in the blood-serum of patients suffering from malaria or ankylostomiasis. The procedure is that of GRIGAUT as modified by Professor Alfredo de ANDRADE of the medical faculty of Rio de Janeiro. GRIGAUT estimates that the normal amount of cholesterin in human blood-serum is 1·5 per mille, but the authors have found that the standard should be 1 per mille only.

In malaria and in ankylostomiasis the amount of cholesterin present in the blood is much inferior to the normal 1 per 1,000. In 20 cases of ankylostomiasis not complicated with dropsy (which would affect the result) the average was 60 per cent. of the normal, and in 15 cases of malaria 43 per cent. In five cases of combined malaria and ankylostomiasis the proportion was reduced to 16 per cent.

J. B. N.

DA MATTA (A. A.). **Yodoterapia y salicilo-yodoterapia endovenosa.** [The Intravenous Employment of Iodides and Salicylates.]—*Gac. Med. de Caracas.* 1916. Dec. 31. Vol. 23. No. 24. pp. 185–187.

The author speaks in laudatory terms of the endovenous injection of large doses of iodides, as practised by KLEMPERER, and of salicylates, according to the method employed by COMSTOCK. The dose of iodide, in a 10 per cent. solution, should begin with 5 grammes and go up to 15 grammes, it being unnecessary to go beyond. The author has published cases of tropical bubo treated very satisfactorily by this method. The dose of salicylate for arthritic manifestations should also be from 5 to 15 or 20 grammes, given in a similar way in a 10 per cent. solution, or the dose of salicylate may be limited to 5 or 10 grammes, which is then followed by the injection of a similar dose of iodide of sodium in 10 per cent. solution. From 20 to 30 cc. of physiological salt solution should be injected through the needle between the two solutions though for what purpose the author does not clearly say. The injections are to be given at intervals of two to four days. The results are surprising in cases of acute articular rheumatism, four of the author's cases having been able to leave their beds within 24 hours. In chronic rheumatic arthritis and chronic gout the treatment only gives relief, but is nevertheless well worth trying. The drawbacks to the treatment consist of nothing more serious than transient headache, temporary intestinal troubles or possibly palpitation.

J. B. N.

HUNTEMUELLER. **Seuchen und Seuchenbekämpfung in Jerusalem.** [Disease and Disease Prevention in Jerusalem.]—*Zeitschr. f. Hyg. u. Infektionskr.* 1916. Vol. 81. pp. 311–318.

Our recent knowledge of the diseases of Jerusalem, and Palestine in general, we owe to MASTERMAN and to MUEHLENS [see this *Bulletin*, Vol. 2, pp. 106 and 153; Vol. 4, p. 410]. The chief "tropical diseases" are, malaria (by far the most important), blackwater fever, typhus, enteric and, on the coast, dengue and oriental sore. The present paper does not add materially to our information. The author went to Jerusalem in January 1913 to start an antirabies department of the "International Health Bureau"; he left in July. On his arrival the malaria season—July to November—was over. He confirmed MUEHLENS in finding that the parasites of aestivo-autumnal fever diminish in the winter in comparison with the tertian and quartan forms; he gives percentages but not the figures on which they are calculated. As is well known, in Jerusalem itself the anopheles breed in the cisterns wherein the water supply of the city is stored. Typhoid occurs at Jerusalem and appears to be very mild. The author saw many cases of a similar disease which he was unable to diagnose by bacteriological methods. The symptoms are detailed. In three cases a Gram-negative bacillus was grown from the stools and urine and in one of these from the blood; Drigalski agar was turned blue. He thinks they may have been typhus, though the clinical picture in the cases seen by MASTERMAN was different.

Other diseases seen were tuberculosis, cerebrospinal meningitis, dysentery (one Flexner and three amoebic). Bilharzia eggs were found in the urine of four patients, two of whom had never left Palestine. Rabies is widely spread in Palestine; the animals affected are chiefly cats. Twenty-eight cases of persons bitten were under treatment when the author left. Trachoma also is widely spread. The author thinks that there are a number of other diseases, of unknown causation.

A. G. B.

JOHNSON (Howard H.) & MURPHY (John A.). **The Toxic Effect of Emetine Hydrochloride.**—*Milit. Surgeon.* 1917. Jan. Vol. 40. No. 1. pp. 58–70.

This is a useful contribution to our knowledge of the dangers in emetine administration. The drug has been used in 142 cases of entamoebic dysentery at an Army Base Hospital in Texas. Two men died "from peculiar and unusual conditions in no way connected with the disease from which they suffered," and five other cases showed signs and symptoms attributed to the emetine. After numerous references to the literature of emetine and its administration and to works on physiology the authors come to their cases.

Case No. 1, aet. 22, admitted August 2nd with entamoebic dysentery; received emetine, August 10–19, gr. 9; August 21–24, gr. 3: September 5–15, gr. 10; September 27–October 3, gr. 3—a total of 25 grains. September 23rd, pulse showed irregularity; October 3rd, pulse rapid, motor weakness and nervousness. October 4th, marked dysphagia, motor weakness manifested by falling forward of the head, irregularity of pulse and, later, extreme acceleration, evidence of congestion at base of both lungs. Died October 5th. Autopsy showed acute atypical lobar pneumonia, lower lobes of both lungs, and septic bronchitis. Last positive examination for amoebae was September 15th.

Case No. 2, aet. 38, admitted September 5th with recurrent entamoebic dysentery. Treatment, first course ½ gr. doses of emetine twice daily for 12½ days; second course ½ gr. daily for 14 days, increased by ½ gr. daily for four days owing to a positive amoebic stool; a total of 23½ grains. October 12th, complained of exhaustion and weakness, unable to hold head upright, difficulty in swallowing with food regurgitation, muscular tremor; October 17th, congestion of lower and middle right lobes, dyspnoea, extreme cardiac distress; October 18th, death. Autopsy showed dilatation and fatty degeneration of right heart, atypical lobar pneumonia, septic bronchitis.

Case No. 3. Acute entamoebic dysentery, received gr. ½ hypodermically twice a day for ten days. Stools remaining positive, dose was reduced to gr. ½ daily continued for 16 days; total 18 grains. On the 22nd day there was weakness, exhaustion and general nervousness, and coarse muscular tremor. On the 24th day weakness of muscle of the neck, so that the head could not be held long in the erect position. There was also irritative diarrhoea and slight acceleration and variation in the pulse rate. Emetine was discontinued on the 26th day and two weeks later patient returned to duty.

Case No. 5, acute entamoebic dysentery, received 23¾ gr. of emetine in 28 days; 23rd day, muscular weakness and increased pulse rate; 28th day, diarrhoea, marked variations in pulse rate, extreme physical exhaustion, lolling of head, coarse muscular tremor.

Two other cases showed similar but less severe symptoms. Case No. 6 had pains in the limbs which clinically were due to neuritis. In cases 1 and 2 attention is drawn to the "vagus effect," vagus section being followed, according to the physiologists, by (1) inability to swallow after food has reached the oesophagus, (2) hepatisation of the lungs, (3) rapid and uncontrolled action of the heart.

The present method of giving emetine in the authors' hospital is as follows :—⅓ grain daily, increasing ⅓ per day till 1 grain is given, continued till 8 grains have been given. Bismuth subnitrate is taken at the same time "in large doses." For the succeeding 10 days colonic irrigations of 1–1000 quinine solution once or twice daily. If the stool is still positive 1 gr. emetine is given daily for three days, by which time the patient has had 11 grains. A third course may be given at a later period if required, if there is no asthenia or other contra-indication.

An account of some animal experiments done by Dr. C. P. McCord is added.

[A case of emetine poisoning similar to these is described in this *Bulletin*, Vol. 7, p. 237.]

A. G. B.

Dalimier (R.). **La toxicité du chlorhydrate d'émétine.**—*Presse Méd.* 1917. Jan. 18. Vol. 25. No. 4. pp. 33–35.

The work described here was done in May-June, 1914. Its publication has been delayed. The author used a "very pure" hydrochloride of emetine coming from the firm of Schuchardt of Goerlitz. He experimented with rabbits and guinea-pigs and gives a table showing the lethal doses for these species after intravenous and subcutaneous administration of the drug; it was some fifteen times more toxic by the venous than by the skin route. He has no data of his own about emetine poisoning in man but gives details of a case recorded by Spehl and Colard.

A man of 28 with amoebic dysentery received for six days two subcutaneous injections daily of 0·03 gm. and then for 12 days the same amount three times a day, or 1·44 gm. in 18 days. There followed, flaccid paresis of all the muscles and especially of the neck, with failure to hold up the head; troubles with deglutition, mastication and speech; oedema of the face, marked diminution of the cutaneous and tendinous reflexes, and rapid and feeble heart's action. The urea and chlorides of the urine diminished. With cessation of emetine and appropriate remedies the toxic symptoms a fortnight later abated.

The author thinks that a dosage of one gramme represents the maximum for safety and that signs of poisoning should then be looked for.

A. G. B.

i. Funk (Casimir). **The Vitamines, their Chemical Nature, their Importance in Metabolism and their Function in the Animal Organism.**—*Amer. Med.* 1916. Nov. Vol. 22. No. 11. pp. 751–756.
ii. Williams (Robert R.). **Some General Aspects of the "Vitamine" Problem.**—*Ibid.* pp. 756–762.

These papers should be read by all who are interested in "deficiency diseases." It is not intended here to summarise their contents but to note some points of interest. Funk has confirmed Seidell's results on the value of Lloyd's reagent (hydrated aluminium silicate) for the separation of vitamine from autolysed yeast [see this *Bulletin*, Vol. 7, p. 378.] He draws attention to the fact that "actual experiments have demonstrated that in the absence of deficiency of vitamines the entire metabolism of organic and inorganic constituents goes wrong"; up to a recent date this factor has not been taken into account. The phosphorus and calcium metabolism are instanced.

Many will agree with Williams when he writes,

> "it must be confessed that the contributions to dietary deficiencies which have been made in large volume during the past three years have not been such as to impress one with the simplicity of the subject as a whole, or the adequacy of our present conceptions. In fact our knowledge appears to be more confused and the ultimate solution more distant and obscure than it did three years ago."

He regards the "specific deficiency idea" first put forward by **Funk** as "a habit of thought" rather than a "well founded theory." The greater part of his paper is taken up by an account of the clinical and pathological evidence, on the one hand, and the chemical, on the other, against the specificity of the vitamines. He writes:—

> "Little and others have shown that white wheat flour produces human beriberi and yet white wheat flour and fat pork are regarded as typical producers of scurvy. Further, although pigeons will maintain full weight and apparent health on whole oats or wheat, guinea-pigs and rabbits develop a scorbutic condition and die. Moreover, McCollum and his co-workers have shown that in contrast to fowls, swine fed on whole wheat develop beriberi-like symptoms which cannot be corrected by the addition of what have been regarded efficient anti-beriberic food stuffs. Moore has described a high incidence of beriberi-like disease amongst swine fed largely on rice polish and with much reason has attributed the disease to the diet. If he is correct we are faced with the fact that the very material which has been most successfully used as a prophylactic against human beriberi in the Orient is the cause of beriberi in swine in Canada. Rommel and Vedder have also called attention to the close resemblance in pathology between cotton-seed poisoning in swine and human beriberi."*

With regard to the chemical side "it has been found possible to effect substantial relief of the paralysis of polyneuritic pigeons with a number of compounds of very diverse composition." After naming some of them he continues, "it would be difficult to imagine a series of compounds of greater diversity which would still possess any chemical resemblance whatever to one another." There are however certain points of resemblance.

"In all of these substances which have been carefully studied the physiological properties are evanescent and automatically disappear when the compounds are kept a few minutes, days or weeks, as the case may be, in a solid state or in pure water solutions," and in some cases the loss of curative power in the solid state is attended by striking changes of crystal form. In one instance at least this change is due to isomerisation, as is illustrated by graphic formulae of two forms of hydroxy pyridine. Certain features of chemical structure which these antineuritic compounds have in common are mentioned. All those known are unstable. Their transformation into stable substances is always attended by a liberation of free chemical energy, which may have something to do with the physiological action.

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* Do not these observations suggest also that caution should be used in arguing from a clinically allied condition in the lower animals to beri-beri in man? Would it not be preferable to eschew the use of this term for the morbid conditions produced experimentally in such animals, *e.g.*, to avoid speaking of "beri-beri in swine" till there is more evidence of its identity with the human disease?—Ed.

As regards the possible nature of the active agents of deficiency diseases the author considers as the most promising line of attack the theory that "the several diseases are caused by toxic substances, in some cases present preformed in food stuffs, but invariably elaborated in the body as by-products of metabolic processes," and brings facts in support, especially what is known about the production of beriberi-like conditions in swine.

A. G. B.

GABBI (Umberto). **Infezione emorragica epidemica scorbutiforme o scorbuto?** [Epidemic Haemorrhagic Scorbutiform Infection or Scurvy.]—*Malaria e Malat. d. Paesi Caldi.* 1916. Sept.-Dec. Vol. 7. No. 5-6. pp. 314-316.

The author draws attention to a form of disease presenting analogies with scurvy, which he first observed among the Austrian prisoners confined in the island of Asinara. Later in the year he came upon cases of the same kind among Italian soldiers who had been serving at high altitudes on the Austrian frontier (Cordevale). The disease commences with gastro-intestinal disturbances and diarrhoea, followed by fever accompanied by pains in the joints of the feet and knees, or wrists. Purpuric patches then appear in the neighbourhood of the affected joints, which are slightly swollen. Bleeding cracks in the skin with tumefaction, and gingival haemorrhages also occur. In some cases the spleen is enlarged, and the liver also to a lesser degree. The heart is unaffected. The appetite remains good, and the mental state is generally normal. None of the usual causes of scurvy were present in these cases, the patients having all been well fed and lodged. The author does not record the condition of the urine, nor the result of any bacteriological examination of the blood, or secretions, but merely wishes to draw attention to the clinical features of this apparently epidemic disease.

J. B. N.

SHEPPARD (A. L.). **Scurvy in Zhob, Baluchistan.**—*Indian Jl. Med. Res.* 1916. Oct. Vol. 4. No. 2. pp. 340-358.

For two and a half years Captain Sheppard, I.M.S. was Medical Officer in Zhob, an area of some 9,000 square miles in the extreme north of Baluchistan. The country is rocky and barren, and the altitude is from three to eight thousand feet. The population may be divided into indigenous, about half of the Zhob militia, amongst whom scurvy is more or less endemic during the winter; immigrants, including the other half of the militia, severely affected; and sojourners, such as the regular troops, free for the last two years.

Various cereals are grown, wheat being the staple crop. No vegetables are raised as a rule; wild vegetables and fruits are gathered in the summer. Meat is eaten in the summer about once a week; in the winter it is dried and treated with salt and asafoetida. The ordinary ration of the militia consists of atta, augmented by dal, ghee, meat and milk "when obtainable and sufficiently cheap"; potatoes, onions and lime juice are sent out to the posts in the winter. However, "locally enlisted men will not take such things even if given to them; green vegetables they regard as food for cattle." It is noted, moreover, that onions and potatoes are four times more expensive than in India.

A table shows the relative scurvy incidence in four years of the various tribes comprising the militia. It is seen that as a rule immigrants were more severely affected than the indigenous people. Whereas the incidence for the whole militia was 23 per mille per annum, the figures for the tribes varied from 121·5 to 11. A table of the monthly incidence shows that of 91 cases 81 occurred in the months January to May, and only 10 in June to December; the seasonal prevalence thus corresponds exactly with food scarcity. A consideration of the yearly incidence at each of ten outposts shows a severe infection at four, but at each post in a separate year, and in order to ascertain if a parallel state of things existed in the Indian prison and Indian native army the records for the last seven years were consulted; the results are tabulated. There is not much evidence of annual variations, but

> "it is noteworthy, however, that 31 prisons in seven years had an incidence of over 5 per 1,000, that these varied considerably from year to year, and 13 of the 31 prisons appear only once, thus indicating isolated outbreaks.
>
> "Many stations mentioned in Table VI [native army] have small garrisons. Here also, as in the prisons and militia outposts, populations are severely affected one year and not again. Explanations of the scurvy in the reports generally attribute the disease to expensive or deficient vegetables, but if this be the whole reason outbreaks should occur whenever similar conditions obtain in other years; moreover, we cannot suppose that supplies in such places as Bombay, Belgaum, Baroda, and Neemuch vary greatly year by year."

The etiology of scurvy is next discussed with special reference to the work of HOLST and FROELICH and the experience obtained in SCOTT'S and SHACKLETON'S Arctic expeditions. Though he does not deny the importance of a "deficient" diet as a factor in the causation of scurvy, the author concludes that there are outbreaks of the disease that are difficult to explain completely in this manner.

He goes on to consider the signs and symptoms of the disease, as observed in 94 cases in hospital; the average time spent in hospital was 37 days and the mortality among the militia was 4 per cent. Seven per cent. of recruits are passed with enlarged spleens but there is no evidence that this predisposes to scurvy. There is a table of the results of blood examination in 20 cases. Notes of five cases of special interest follow.

The author concludes by stating that he saw many cases among the Indians in France in 1914–15; onions, potatoes, fresh meat and lime juice were regularly issued [it is not stated whether these articles were actually eaten] and fresh milk was bought. More recently he has seen cases in Mesopotamia, where "ration deficiencies seem to have been an important factor."

A. G. B.

BOYD (T. Crawford). **Scurvy—A Short Note.**—*Indian Med. Gaz.* 1917. Feb. Vol. 52. No. 2. pp. 41–42.

Captain Crawford Boyd, I.M.S., describes five cases of scurvy which occurred amongst recruits in training, apparently at Dharmsala, a hill station in the Punjab. One died after 47 days in hospital. The diet received by these men is given and analysed; it appears that it yields 5,470 calories. A short account is then given of recent work on protein constituents of food and accessory substances or vitamines.

It is stated that "one of the most notable features of the cases is the relatively slow progress towards recovery, even when given a liberal diet of fresh food and vegetables, and also the fact that lime juice seemed to have very little beneficial effect *per se.*"

A. G. B.

SANTANGELO (B.). **Anemia splenica infantile con linfocitemia a decorso febbrile e ad etiologia ignorata.** [A Case of Infantile Splenic Anaemia, with Lymphocythaemia and Febrile Symptoms, of Unknown Origin.]—*Malaria e Malat. d. Paesi Caldi.* 1916. Oct. 20. Vol. 7. No. 5–6. pp. 292–301.

The author has already recorded fatal cases of illness in children, much resembling kala azar in their course, but giving absolutely negative results to cultural and microscopic tests. He now reports another case of the same kind.

The patient was a female infant, aged 16 months. Had lived since birth in a malarious district near Rome. Family history good. The child was brought up at the breast until nine months old, and then had a mixed diet of milk and farinaceous foods. At three months of age, she began to suffer with irregular fever, beginning in the morning with rigors and cyanosis and terminating at 5 or 6 p.m. with abundant sweating. At the end of 2½ months the fever assumed a more recurrent form, lasting continuously for four to five days and then being followed by an apyretic interval of six to seven days. The child, as a result, lost flesh and became anaemic. The treatment employed consisted of the administration of quinine and arseno-ferruginous tonics. Upon examination the child was noted to be somnolent and listless. The skin was yellow and anaemic, and almost devoid of fat, the dentition normal, and the tongue furred and pale. The glands of the neck, groins and axilla were enlarged, but moveable and not painful. No signs of rickets. Heart and lungs normal. The abdomen was enlarged and frog-like in form, with a venous net-work apparent in the hypochondriac and epigastric regions, and measured 44 centimetres round at the level of the umbilicus. The liver and spleen were both notably enlarged, smooth and not tender to pressure. Wassermann and von Pirquet reactions in both parents and child were negative. Urine normal. In the stools neither parasites nor ova were found. A spleen-puncture showed no parasites of any kind, and serum tests and cultures of every kind were completely negative. The child was only kept in hospital for six days, being then removed by its parents, and it died soon afterwards, no autopsy being obtained.

Several examinations of the child's blood gave an average count of 2,339,000 red cells per cmm. with haemoglobin 45 per cent. of the normal; the leucocytes were 49,675 per cmm. or 1 to 47 reds. The percentage of lymphocytes, large and small, was 72, mononuclears 1 per cent., polynuclears 21, and eosinophiles 0·4, transitional forms 1·8 and myelocytes 2 per cent.

The author proceeds to discuss these data, and comes to the conclusion that there is a form of chronic splenomegaly in children, with anaemia and lymphocythaemia, not hitherto classified, which, though rare, is of a distinct type. A bibliography of papers bearing on the subject is appended, mostly Italian.

J. B. N.

WENDER (Louis). **The Role of Syphilis in the Insane Negro.**—*New York Med. Jl.* 1916. Dec. 30. Vol. 104. No. 27. Whole No. 1987. pp. 1286–1292.

The author is Assistant Physician to the Government Hospital for the Insane, Washington, D.C. The material utilised for his paper consists of 106 coloured male patients admitted in 12 months, 1914–15; all but 20 were residents of the District of Columbia. Of these 106 fifty-three were shown by a Wassermann to be infected with syphilis; there were 21 in whom the relationship between the existing psychosis and syphilis could not be clearly established, and 32 who suffered from cerebro-spinal syphilis (11) or general paralysis (21). These figures, compared with those of other investigators, are stated to be high, especially when it is considered that "the Washington negro belongs to a higher social stratum than the average negro." Details are given of the Wassermann tests. In some cases the blood had to be examined several times to clear up the diagnosis. In one unquestioned case a positive reaction was not obtained till salvarsan was given. Twenty-six cases had nephritis. The author writes:—

> "Stengel and Austin,* in speaking of syphilitic nephritis, mention a chronic form in which syphilis is the etiological factor. It is in the later stages of syphilis that amyloid and interstitial kidneys are common. These authors believe that there exists a parenchymatous type of nephritis due to syphilis, characterized by albumin, hyaline and granular casts, with occasional tendency to produce edema of renal distribution. Out of eighty-four cases of nephritis they found sixty-six with syphilis as a possible cause for the disease. Of the eighteen remaining there existed in eight either an unquestionable history of syphilis or a positive Wassermann, or both. In six no Wassermann was secured, while in four syphilis was definitely excluded."

The author's cases bear out these statements [see also McNEIL, this *Bulletin*, Vol. 9, p. 96]. The paper goes on to a description of the symptoms, diagnosis, prognosis and treatment of the cerebral syphilis and paretic groups respectively, some cases being discussed in detail, and ends with the following conclusions:—

> "1. Our findings seem to justify the conclusion that syphilis is prevalent to a marked degree in the coloured race. . . .
>
> "2. The occupations of waiter, barber, and cook, in which the negro is so widely engaged, offer many opportunities for the transmission of this disease by routes other than the sexual, and a demand on the part of the general public that employees in this field have a physician's certificate that they are free from syphilis, would undoubtedly tend to limit the spread of this disease.
>
> "3. Syphilis should be suspected in cases of nephritis where no other definite cause can be found, especially in middle aged people.
>
> "4. A negative blood Wassermann does not exclude syphilis, and suspected cases should have a provocative test. Spinal fluid examination should be made in all cases of suspected syphilis of the central nervous system. Moreover, this procedure is justified even in cases of general syphilis, especially in the secondary stage, with the hope of recognising central nervous involvement in its earliest stages."

A. G. B.

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* Syphilitic Nephritis, *American Journal of Medical Sciences*, 1915. Vol. 149.

BOYÉ (G.) & CLARAC (G.). **La pneumococcie chez les tirailleurs de l'Afrique occidentale. Observations cliniques et thérapeutiques.**—*Paris Méd.* 1916. Dec. 30. Year. 6. No. 53. pp. 568–571.

The authors have treated in France 387 bacteriologically confirmed cases of pneumococcus infection in natives of West Africa—pneumonia 164, broncho-pneumonia 129, pulmonary congestion 94—all young robust subjects. The death-rate was 8·12 per cent. In similar Frenchmen the mortality would have been nil. The authors discuss the reasons of this and come to the following conclusions:—(1) Natives of Tropical Africa are specially receptive to the pneumococcus. It does not appear particularly virulent in them. The large number of cases observed is to be attributed to simultaneous incubation rather than infection from man to man. (2) The resistance offered by these natives to the pneumococcus is generally lessened by reason of cardiovascular instability, which frequently takes the form of cardiovascular weakness. In all the patients there was a striking lowness of arterial pressure prolonged even into convalescence. The fatal issue in almost every case was attributable to or precipitated by this vascular weakness, which is also a cause of the sudden death that is so frequent in pneumonia in natives. (3) This weakness is attributed to the abuse of kola nut, the sudden suppression of which may produce serious symptoms, especially in the presence of an attack of disease. (4) Consequently, it is advisable to give kola nut not only to the patients but to healthy natives, especially when increased activity is demanded of them. The authors add that it is not a panacea and that the drugs found universally useful in pneumonia must be employed as well.

They refer to a paper by CARNOT and KERDREL [this *Bulletin*, Vol. 8, p. 390], saying that in their own cases there was no evidence of the increased virulence of the pneumococcus of which these authors speak. There were as a rule no signs of gravity and it was difficult to keep the patients in bed. It is noted that pneumococcus infection is severe even in Africa amongst natives of Senegal and the Soudan; LE DANTEC writes that it resembles the form seen in Europe in drunkards and old men. As to the arterial pressure, a study of seven healthy natives placed this at 14–10 and a similar result was obtained in 16 surgical patients and 16 dysenterics. The corresponding pressures of the pneumonia patients were almost always below 12–8. The Riva-Rocci method was used. Brief details of six cases are given in which the administration of kola produced a marked rise of pressure; each patient has two to three nuts a day.

A. G. B.

RUDLER. **Enquête sur l'alcoolisme dans la population scolaire indigène de l'Algérie.**—*Bull. Soc. Path. Exot.* 1916. Dec. Vol. 9. No. 10. pp. 773–777.

Dr. Rudler in 1910 began to study alcoholism in Algeria and drew up a questionnaire which was sent to all the schoolmasters. He died in the same year. The replies were however collected and sent to Dr. Edmond SERGENT, to whom we are indebted for the paper published under Rudler's name. The questionnaire is given. The native population of Algeria consists of Jews and Mussulmans; this enquiry relates only to the latter. The Mussulmans are of both Berber and Arab race. In the south exists a race of doubtful origin, the Mozabites or people inhabiting the Mzab, and a negroid race, the Harratin, settled in the oases. Discussion of the replies is classed under country, large towns, and Southern Territories (oasis). In the former the danger of alcoholism is stated to be insignificant (country) or developing in workshops where both natives and Europeans are found (towns). In the South alcoholism is "making terrible progress amongst the settlers of the Saharan oases, where even the children are tainted." These peoples drink absinthe, anisette, and mahia (date spirit). Amongst the Mzab almost all the Jewish households have their own still. At Ghardaia cases of acute alcoholism are fairly common among adolescents; they invariably get drunk on occasions and fête days. The schoolmasters express the opinion that if the Koranic law is not sufficient to keep the Mussulman from alcoholism instruction in schools will be useless. Many urge absolute suppression of the sale of fermented drinks, especially absinthe and anisette, and that the interdiction of that of kief and hashish be better enforced.

A. G. B.

INDIAN JOURNAL OF MEDICAL RESEARCH. 1916. Apr. Vol. 3. No. 4. pp. 742–762.—**Pyorrhoea alveolaris and Associated Conditions among Indians and Europeans.** A Report received from the Kitchener Indian Hospital, Brighton.

This was a statistical enquiry* instituted with the object of obtaining a standard of comparison for the future, and to shed light upon "the degree of ineffectiveness produced in a soldier population by the presence of mouth defects traceable to, or said to be a consequence of, pyorrhoea." It was decided at the outset that the enquiry should not be bacteriological. It is pointed out that the Indian soldier is a selected person, "in particular as regards soundness of his teeth." Pyorrhoea needs defining. It was taken by the authors to connote "a gingivitis with recession or hypertrophy of gums, pocketing between gums and teeth, with or without the actual presence of pus." The subject is divided into:—(1) General conditions associated with pyorrhoea and dental caries, which may be related to them either as cause or consequence; (2) local conditions; (3) comparison of degree of these affections in (*a*) Indians and Europeans, (*b*) different classes of Indians. The findings are given in 36 tables.

The available material consisted of 185 sepoys, the majority of whom (136) suffered from gun shot wounds; 76, or 41 per cent. had pyorrhoea, in the sense defined. Forty bhistis, 31 sweepers, and 66 European ward orderlies were also used; these were not patients but personnel. Special attention is drawn to the comparison between Indians and Europeans as regards caries.

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*Conducted by Majors S. P. JAMES, W. S. WILLMORE, W. F. HARVEY, T. H. GLOSTER, all of the I. M. S. and Mr H. L. DORELL, Dental Surgeon to the Hospital.

The summary given is as follows :—

"1. Pyorrhoea and caries show steady increase with increase of age.

"2. Some association is shown between pyorrhoea and rheumatism. The influence of age has to be taken into account.

"3. There is little evidence from our figures of a connexion between such constitutional states as gastrointestinal disturbance or anaemia and caries or pyorrhoea.

"4. None of the associations involving local conditions, such as mouth acidity and caries, pyorrhoea and caries, tartar accumulation and caries, chewing or smoking and preservation of teeth, cleansing and preservation, diet and pyorrhoea or caries—showed as high a degree of association as might have been expected from current ideas on the subject. The peculiar character of the population under examination has to be taken into account before we lay too much stress on these findings. The method of investigation adopted by us is, however, one which we feel we can heartily commend as being likely to lead to chastening of previous impressions.

"5. The institution of comparisons between Indians and Europeans of the class we examined, leaves us in no doubt about the greater preservation of teeth in the former."

A. G. B.

BOOK REVIEW.

RUIZ-ARNAU (R.). La Lymphectasie Tropicale Primitive.—138 pp. 1916. Paris: A. Maloine et Fils, Editeurs, 27, Rue de l'Ecole-de-Médicine.

In this interesting work the author deals with the different affections of the lymphatic system, so often met with in tropical climates, and attempts to prove that some are not necessarily filarial, but are due to climatic causes per se. Such opinions have been brought forward before, and have advocates even at the present day, but now opinion leans more and more to a specific cause for all tropical maladies, with climate influencing the results in various ways. The study of the different manifestations of filariasis is by no means an easy one, many of the pathological changes involved being imperfectly understood and not yet thoroughly worked out. Recent researches have however proved that conditions such as simple hydrocele and simple inguinal and femoral adenitis are in many instances really due to filariasis, WISE's discovery of calcified adults allowing one to state definitely that the parasites have been there and by their presence have produced the pathological entity. Remembering these facts therefore one may approach the contents of the present work. The author presents in tabular form the number of cases which he has observed, these forming the basis of his remarks. As this table is interesting it may be quoted in full :—

Endemic lymphangitis of the lower limbs	38	cases.
Recurring dermatitis of the feet	66	„
Simple oedema of the legs (non classifiable)	38	„
Oedema of the malleoli (ditto)	11	„
Inguinal adenitis (ditto)	175	„
Simple hydrocele	109	„
Filariasis	3	..
	440	

This may with advantage be critically analysed later, together with another table comparing the author's primitive *lymphectasie* with filariasis. This is as follows :—

Filariasis.	*Lymphectasie primitive.*
Elephantiasis of the legs.	Simple chronic oedema of the legs and malleoli (*lymphectasie primitive reticulaire*).
Adeno-lymphocele.	Non-classifiable enlargement of glands (*lymphadenectasie simple*).
External genital filariasis.	Frequence of simple recurring lymphangitis of the scrotum.
Internal genital filariasis.	Frequence of simple hydrocele.
Craw-craw [*Sic*]	Recurring acrodermatitis (*lymphectasie primitive radiculaire*).
Elephantiasis of the arms.	Frequency of recurring lymphangitis of the arms.
Elephantiasis of the breast.	Dermatitis " iterative " of the nipple and subsequent lymphangitis.

This table is not convincing, most of the symptoms given under the second heading being really the early manifestations of the former. Why Craw-craw should have figured here is inexplicable. It has probably nothing to do with filariasis, but even if it has, then *Filaria perstans* is the parasite implicated, not *Filaria bancrofti*. This specific instance is a good example of a statement made once and then accepted by writers and others without confirmation. Once such a statement appears in the literature it seems to be perpetuated *ad infinitum*.

As regards the first table, surely no one knowing the West Indian Islands would accept the three cases of filariasis out of the 440 as being the only ones due to this parasite. The vast majority of the other lesions are almost certainly due to the same cause, and definite proof might have been forthcoming if proper blood examinations had been made.

If one accepts elephantiasis as filarial in origin, one must do the same for the vast majority of endemic lymphangitis cases (Filarial lymphangitis) as the latter is the precursor of the former in almost every instance and shades insensibly into it.

Where a real difficulty is met with is, that *all* elephantiasis and certainly all hydrocele cases are not filarial, as the former though very rarely, does occur in temperate regions, while the latter of course is common. Now admitting this, one must also admit that such non-filarial cases may equally well appear in filarial districts and it must necessarily be difficult to decide which is which. To get an idea how often this happens one must study tropical regions where filariasis is non-existent or at any rate very rare, and if Dr. Ruiz-Arnau had done this before committing himself to print he would have found that his primitive lymphectasie cases were practically non-existent there or at any rate only occurred in a similar ratio to that met with in temperate regions like England. This is one of the chief reasons why one is so certain that the *F. bancrofti* is the real cause of such lesions. Another lies in the records of post-mortem examinations which, as already stated, prove up to the hilt that cases which were thought clinically during life to be simple hydroceles or simple adenitis, were after all due to the presence of filaria in the tissues of those parts. There is no mention of any post-mortem work in Dr. Ruiz-Arnau's manual, a serious omission when one is trying to propound a new theory of a magnitude such as this. The work is too theoretical throughout and much more proof is required to support the writer's statement on page 101–102 that a particular lymphatic condition latent or manifest exists, specifically derived from the influence of a continued tropical climate. To help himself with the specific action of the tropical factor he calls to his aid sprue, but surely he could not have chosen a worse example, for here again if due to climate why should the disease be limited to parts of the tropics only and not occur generally?

The same looseness occurs in the chapter on so-called primitive enlargement of lymphatic glands, where the author perpetuates the old error of climatic bubo being plague. The elucidation of the cause of glandular enlargements in the tropics is difficult it is true, but it will certainly not be simplified by arguments such as these. Everything, even here, points to a specific cause. Some buboes are real plague, pestis minor or major; some are climatic, by that term being meant a disease acquired after sexual intercourse with black women; some are truly venereal, syphilis, soft sore, or gonorrhoea; some are filarial; some are due to trypanosomiasis, and so on, but we still await the demonstration of the proof that any are due to climate *per se*.

Though one cannot agree therefore with the author's theory of tropical climate as a cause of the diseases mentioned, yet one cannot deny that once the real cause is there climatic and other conditions may influence the symptoms present. Attacks of filarial lymphangitis are certainly less common in a cold bracing climate than in the damp tropical heat, but here again, the real explanation may lie in the fact that the secondary bacterial contaminators are less active in the cold than in the heat. (Compare boils and other staphylococcic infections). More researches are required to prove the exact mechanism of the production of many of the filarial manifestations because, though the filaria is the primary cause, organismal and other influences undoubtedly play a part in producing the pathological changes. Dr. Ruiz-Arnau's work will therefore do good in bringing this branch of tropical medicine before the profession in a new light and if it stimulates someone to thrash out these problems anew, then it will not have failed in its object.

G. C. Low.

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